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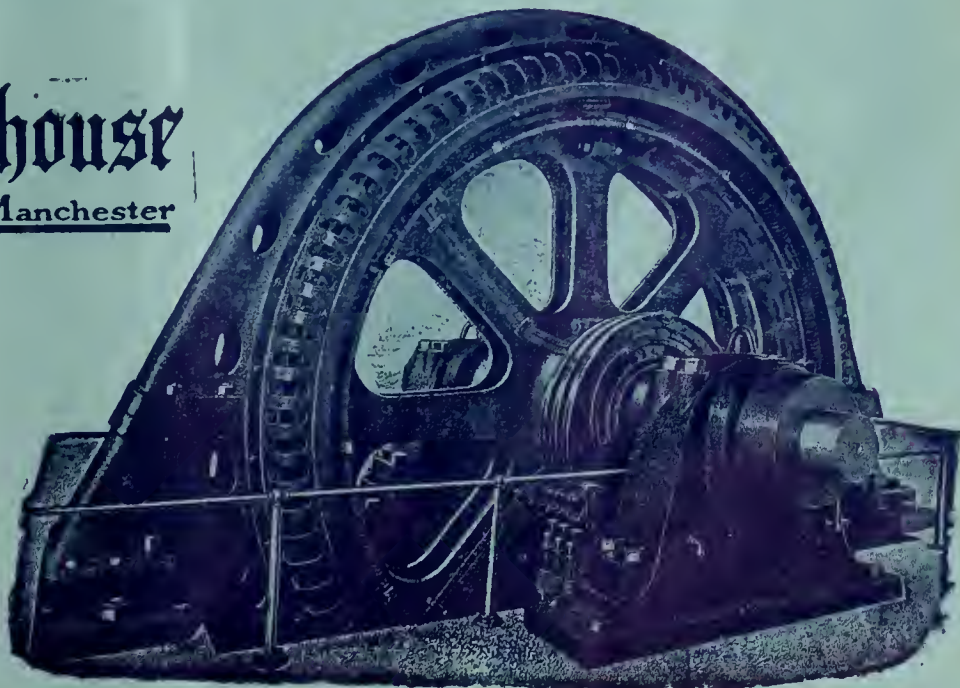
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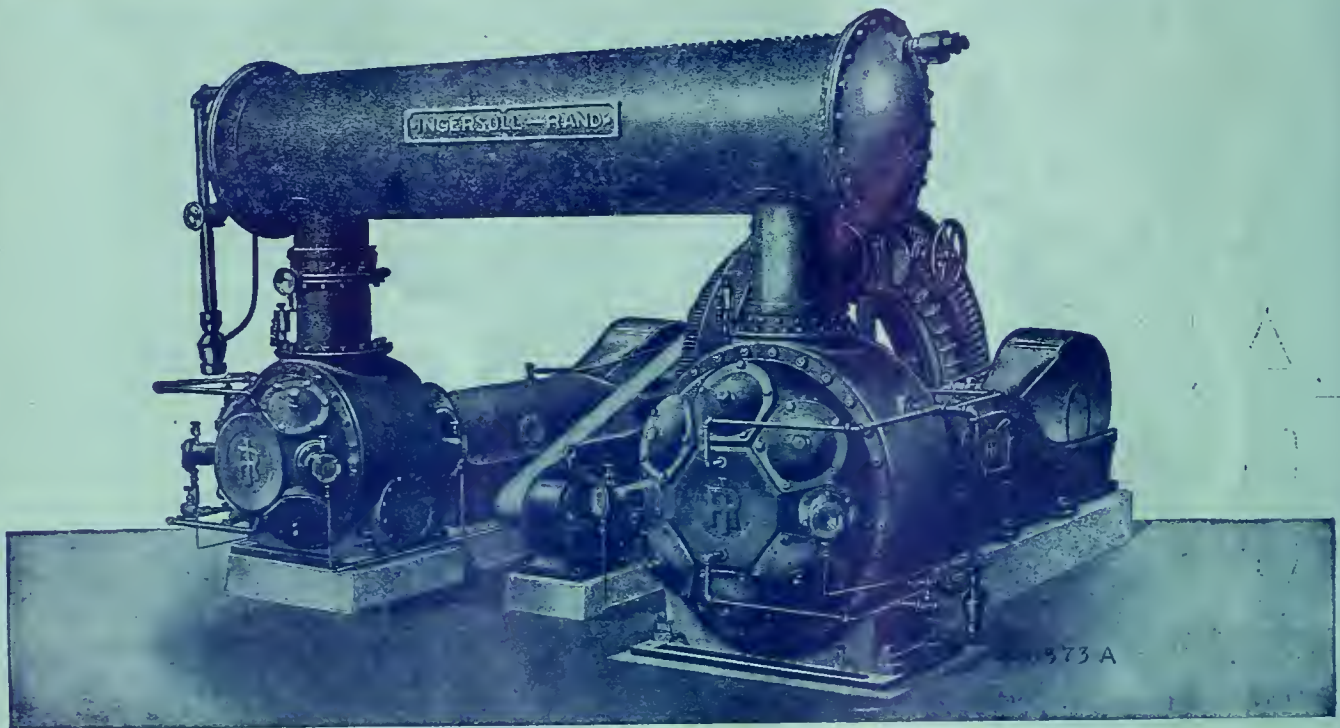
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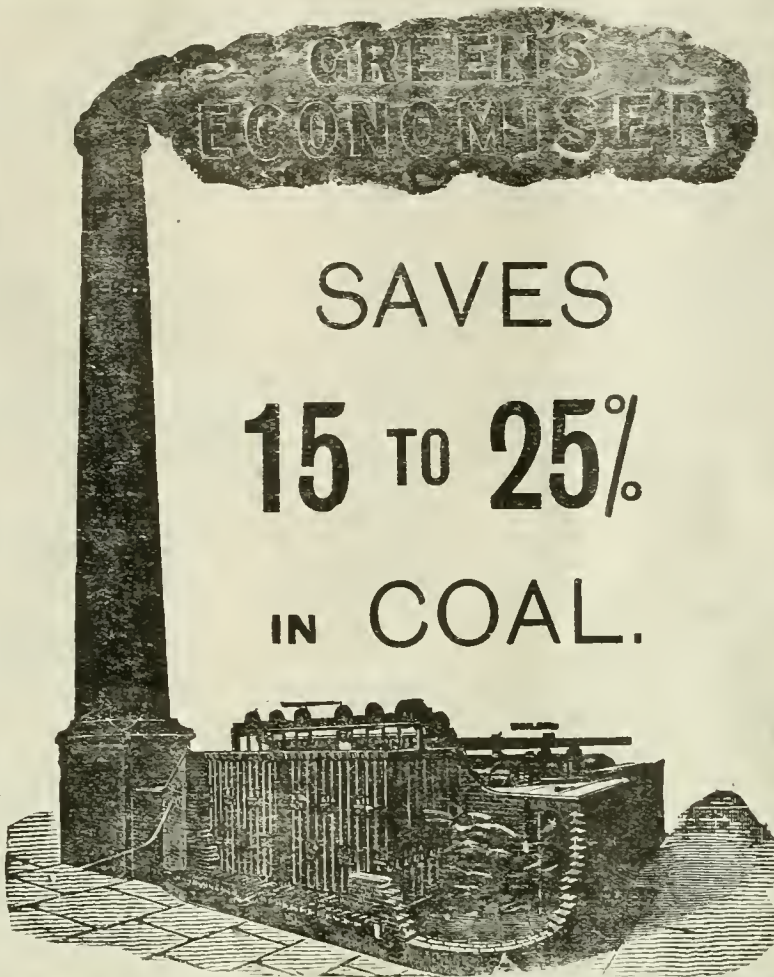
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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.**CONTENTS.****PAGE.**

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Notes and News.

The Chamber of Mines' returns for July, 1916, show that 18,217,227 tons of rock were mined on the Witwatersrand for the seven previous months, as compared with 17,881,671 tons for the corresponding period of last year. Sorting averaged 0.25 per cent less at 9.47, and tons milled were 16,542,106 as against the 16,129,830 recorded twelve months ago. The total output for the seven months was greater at £22,105,985 than it was when declared in July, 1915, at £21,219,994. Recovery averaged 26s. 8d., as against 26s. 3d., but working costs came out at 18s. 1d. compared with 17s. 4d., the result in the shape of working costs being 8s. 1d. per ton milled to the end of July, 1916, and 8s. 6d. per ton milled for the same seven months of the previous year. The total working profit for the period was £6,721,461 as against £6,846,793, a difference of more than £100,000. The figures for July alone, as regards the Witwatersrand, are:—Tons mined, 2,558,586; sorting, 8.76 per cent.; tons milled, 2,370,244; recovery, 26s. 1d. per ton milled; working costs, 17s. 10d.; working profit, 8s. 0d.; all of which show generally a falling off on the previous averages for the year, except in the case of working costs, where there is an improvement of 3d. per ton milled.

* * * *

The secretaries of the Chamber of Mines have issued a circular to the effect that in consequence of the 10th of September being a Sunday, the gold output for the month of August will be declared on Saturday, the 9th proximo. Returns of operations are therefore expected not later than the 7th of September.

* * * *

The western Witwatersrand and the country which lies still further towards the north-west, in the Blaauwbank district, have long been a favourite area for small mining syndicates. One reason for this kind of activity has

doubtless been the local enrichment of some of the more northerly reefs of the Witwatersrand in those parts. The same local enrichment which has given rise to the various enterprises outside the limits of the Main Reef series has also been the cause of their failure, and it is needless to say that a great deal more money has been spent in prospecting and mining on the northern reefs than was ever likely to be recovered. Apart from these outer reefs of the Witwatersrand system, however, there are large areas of Black Reef formation where good average values persist for long distances. In some places excellent returns have been obtained from milling operations, but difficulties and collapse have arisen from the fact that the characteristics of the Black Reef have not been sufficiently studied and work has been undertaken upon a scale and plan that was not adapted to actual conditions. From the description which is given of certain areas which have recently been taken in hand on the West Rand, it seems clear that the Black Reef has again been considered worth mining in a modest way, and the neighbourhood of the old Queen's Battery may once more be the scene of active work. As far as the more distant field of Blaauwbank is concerned, the same inability to recognise and appreciate the peculiar conditions of the auriferous deposits is probably sufficient to explain the failures that have usually followed in due course upon the intermittent efforts of the past twenty years or so. Witwatersrand methods have not invariably been successful upon the Witwatersrand itself, and obviously they cannot be expected to meet the case in regions where geological and other conditions are quite different.

* * * *

A paper that should give rise to some discussion at the next meeting of the Chemical, Metallurgical and Mining Society, and would assuredly arouse interest at a meeting of the Institution of Mining and Metallurgy if it were read

there, is one on "The Valuation of Mines," that has lately been contributed to the transactions of the former society by Professor R. A. Lehfeldt, D.Sc., of the Transvaal University College. The writer appears to be under the impression that the subject has not been dealt with algebraically, or, as he puts it, "on an algebraical basis," and if the range of his investigations include only those works to which he refers in a footnote, one can easily understand why he regards his contribution as meeting a long-felt want. As a matter of fact, the subject of mine valuation has been handled on an algebraical basis by several writers whose names do not appear in Dr. Lehfeldt's list, and since it cannot be supposed that he is unaware of this fact it is to be concluded that what is really meant is that the algebraical statements of these persons is merely of an elementary kind. To some extent this may be so, but they meet the requirements of the ordinary student sufficiently well. On the other hand, we are inclined to think that the equations given by Dr. Lehfeldt, while they have the merit of being comprehensive, are unnecessarily complicated. He does not agree with the view that two rates of interest, which we have occasionally referred to in this journal as the remunerative and reproductive rates respectively, are necessary or even advisable in expressing the essential facts of a process of mine valuation, and if his formulae are somewhat complicated on the basis of a single rate it is obvious that they become still more so when two are to be considered. Dr. Lehfeldt proceeds by way of the calculus to estimate the present value of a mine at the time of starting the mill, and for this purpose the question of the capital expenditure, which has to be deducted from the present value of the total working profit is carefully thought out. As both capital expenditure and working costs may be divided into portions which represent fixed amounts and amounts which are proportional to the scale of operations, these items are separately expressed in the formulae. Finally, in order to arrive at the maximum possible present worth of a mine which can be worked upon various scales, the methods of maxima and minima are adopted with very interesting results. The use of the calculus is, of course to be recommended in those cases where it is desired to see the relationship of all the factors concerned in this problem of most profitable working, but ordinarily the element of capital expenditure, for instance, might conveniently be dealt with separately. The paper is valuable, among other reasons, for the authoritative figures relating to mining operations in the East Rand, which have been obtained from the Mines Department. An interesting and striking diagram of maximum values which may be compared with the well-known diagram of Mr. Ross Browne is included in the paper. Apart from the question of the remunerative and reproductive rates which is too large a subject to be discussed in these brief notes, we think that Dr. Lehfeldt is to be congratulated on a contribution which shows the process of mine valuation in a somewhat unusual and distinctly attractive form.

* * * *

A special general meeting of members of the society will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 11th September, 1916, at 8.15 p.m., at which the following resolution will be submitted for consideration and adoption if thought fit:—"That the Geological Society of South Africa agrees to merge its collection of books, journals, and future exchanges with the Seymour Memorial Library, on condition:—(a) That the Society has the right to appoint annually two members to the Library Committee, one of whom shall be appointed on the Book Selection Committee, and that the Society's collection of books should be made a nucleus of a geological section of the Seymour Memorial Library, this section to have its own catalogue. (b) That the Seymour Memorial Library remains as a technical and scientific reference library open to the public, and as such continues to be housed in the centre of the town of Johannesburg." Members only. Immediately following the special general meeting the ordinary monthly meeting of members will be held, at which the following business will be transacted:—The minutes of the ordinary monthly meeting held on the 3rd July, 1916, will be read. The following papers will be open for discussion: "The Karroo Rocks and

Later Sediments North-West of Bulawayo," by A. M. Macgregor, B.A. (Cantab.); "Diamonds from the Molteno Beds," by E. H. L. Schwarz, A.R.C.S.; "An Interesting Outlier of Karroo Rocks to the North of Olifantsfontein Station on the Germiston-Pretoria Railway," by P. A. Wagner, D.Eng., B.Sc. The following paper will be read: "Notes on the Geology of Natal," by E. H. L. Schwarz, A.R.C.S. Visitors invited.

* * * *

It is officially announced that after careful consideration and with the view of meeting public requirements as represented to the Department by various telephone subscribers throughout the Transvaal and Natal, it has been decided to restore the numerical index in the Transvaal-Natal Telephone Directory, and to transfer the present centre page advertisements to the foot of each page, commencing with the October issue. It is hoped that these improvements will make the Directory of more general utility. Coincident with the changes mentioned the Department proposes to divide the book into two volumes as for the Transvaal and Natal respectively. Subscribers in the Transvaal who make frequent calls to Natal will be furnished with a copy of the Natal Directory, but they should make application therefor before the 1st September in order that a sufficiently large supply may be obtained. Their names will then be recorded on a special list and future issues of the Natal Directory will be forwarded as the books are published. Transvaal subscribers who make only occasional calls to Natal will be able to obtain the numbers of subscribers' wanted from the "Trunk Inquiries" operator.

* * * *

The Institution of Mining and Metallurgy (representing the mining and metallurgical industries other than those of coal and iron), as a result of numerous requests, has been in communication since October last with the Chancellor of the Exchequer on the question of the excess profits tax, with a view to effect an equitable adjustment of the incidence of the tax, on the basis of recognition of the fact that mines are wasting assets and that so-called "profits" of mining enterprises should be regarded as in large measure amortisation of capital. This principle applies to all metalliferous mines, but especially to gold mining enterprises, where the effect of war is seriously to reduce "profits" by reason of the fact that the price of gold is fixed and the cost of working is greatly increased by the enhanced cost of labour, machinery, supplies, freights, etc. The principle is now recognised, and the institution has reason to believe that it will also be taken into full consideration by the Board of Referees appointed under the Finance Acts, to whom the institution proposes to submit an appeal on behalf of the metalliferous mining industry generally. As it is difficult in existing circumstances to communicate direct with all the companies concerned, the council of the institution invites representatives of the companies affected to attend a private meeting at River Plate House, Finsbury Circus, E.C., on 8th August, to discuss the matter and to decide the action to be taken. Resolutions were submitted to the meeting dealing with procedure in regard to the excess profits tax appeal and a committee of twelve were appointed to act with the Council on this question and also in the consideration of the wider questions of taxation, etc., affecting the mineral and metal industries. It is important that all companies interested or intending to be represented at the meeting should communicate with Mr. C. McDermid, secretary of the Institution of Mining and Metallurgy, at the house of the institution, No. 1, Finsbury Circus, E.C.

* * * *

Some time ago, Mr. W. T. Hallimond gave the *South African Mining Journal* a very interesting account of the mica fields that lie to the south-east of Leydsdorp, where, as has been pointed out by others also, there is an area of mica-producing ground that shows most favourable geological conditions and yields a mineral that has, at sundry times fetched the best prices on the London market. As the records of the Mines' Department show, however, the production of the mineral has been of a somewhat spasmodic kind. Some mica which has recently been brought down

Mica.

country from that neighbourhood, has again drawn attention to its possibilities. A sample of about 600lbs. weight has been taken for experimental cutting purposes, from a trench 62 feet in length, which is said to carry mica over a width of six feet over the whole distance, while the end of the occurrence has not yet been reached. It is impossible to say how far the mineral extends in depth, but as far as the work has already gone there is sufficient to show that the mica occurs in unusually large masses. The average size of the sheets from this sample is 5 inches by 4 inches, for which the price ruling in London is between £700 and £800 per ton. It is interesting to note that the last issue of the *Queensland Government Mining Journal* has an article by one of the geological staff, upon the possibilities of a mica industry in that State. The market prices that prevail are somewhat difficult to obtain now-a-days, and the article is deserving of a reference by reason of the trouble which has obviously been taken to get at reliable figures.

* * * *

According to the papers, the "T.C.L." people have decided to start drilling on their farm Holfontein 29 on the Far East Rand. The point seems to have been overlooked that a considerable amount of drilling has already been done on that farm; and that what the company doubtless now intends doing is to test the value of the ground more thoroughly. The drilling record of the ground is as follows:—

Borehole No. 1.—Results: Modderfontein Series, 705ft.; Van Ryn Series, 968ft., 2 dwts. over 2½ in.; total depth, 1,041ft.

Borehole No. 2.—Results: Modderfontein Series, 320ft.; Van Ryn Series, 2¾ dwts. over 2½ in. at 605ft.; total depth, 810ft.

Borehole No. 3.—Results: Van Ryn Series, 706ft. ¾ dwts. over 6½ in.; total depth, 801ft.

Borehole No. 4.—Results: Joint Borehole Holfontein and Kalboschfontein; Van Ryn Series, 781ft., results poor; continued to 1,000ft., results no better.

Borehole No. 5.—Result: 2,184ft. dyke.

* * * *

After months of negotiation, agreements have been signed between the Chamber of Mines and the S.A. Engine Drivers' and Firemen's Association, one according certificated winding drivers improved working conditions, and another establishing a

The Mines and the Engine Drivers and Firemen.

Board of Conciliation. The rates of pay for winding drivers are fixed for surface work at 2s. 6d. and 2s. 9d. per hour, according to the load of the engine and for underground work at 2s. 8½d. and 2s. 10½d. per hour. In addition, an increased rate is fixed for continuous service, varying from ½d. per hour for between one and two years' service to 2d. per hour for over four years' service. Generally speaking, the maximum rate now paid is 22s. 6d. per shift under the agreement, and with pay for continuous service, winding drivers will be able to reach 23s. 4d. on the surface and 25s. underground. The agreement also deals with Sunday working, overtime, Christmas and Good Friday. It is laid down that a month's notice must be given for the termination of an engagement. Regarding holiday leave, this ranges in the case of underground drivers from 12 days on full pay for men with between one and two years' service underground, to 24 days for men with over three years' service underground. For surface men, 14 days are allowed after one year's service. The maximum pay for both underground and surface men during leave is fixed at 20s. The agreement will come into force on October 1, but it is made retrospective as from March 31 last. The other agreement provides for a Conciliation Board, consisting of five representatives of the Chamber of Mines and five of the Association.

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The fourth ordinary general meeting of the Gold Fields Rhodesian Development Company, Limited, was held in mail week, at the Cannon Street Hotel, E.C. Lord Harris presided, and, in moving the adoption of the report for the year ended March 31 last, referred

Rhodesian Gold Fields Development.

at considerable length to the satisfactory results achieved during the period under review on the Falcon Mines property, one of the company's principal investments. The report was adopted.

TOPICS OF THE WEEK.

ENEMY TRADING.

THE feature of the annual meeting of the Witwatersrand Commercial Exchange—a report of which appears elsewhere in this issue—was the question of enemy trade. It was proposed that enemy firms found trading in the exchange should be put off, and that doubtful firms should be treated in the same way if they failed to supply details of their shareholdings. The Chairman, however, said the committee had taken legal advice, and it was against them. A member mentioned that Britishers had sold goods in the Exchange which had been handed to them by interned Germans, and for which they had received money, and he naturally inveighed strongly against this. The suggestion was put forward that if enemy firms could not be put off, the Exchange should be liquidated, and a new code of rules adopted. Eventually it was left to the new committee to go into the whole matter, the meeting being unanimous on the point that Germans should be ousted. It is noteworthy that the same burning question will be first on the agenda of the forthcoming meeting of associated Chambers of Commerce of South Africa to be held at Capetown next week. The great problem of outstanding importance with which that Congress will be called upon to deal is that of the trading policy to be adopted by the Empire after the war. In this connection the Johannesburg Chamber has drawn up detailed recommendations. A number of these are directed to co-operation between the Imperial Government and the Dominions, with a view to making the Empire self-supporting, the frustration of control by foreign influences, the safeguarding of new or "key" industries, the prevention of dumping and under-valuation of foreign goods imported into British markets, the strengthening of the Consular Service in the interests of British trade, and the adaptation to industrial and commercial needs of technical instruction and scientific research. Another set of resolutions from the Rand deals with the economic situation within the Union, and aims at a substantial rebate in the Customs tariff in favour of the products and manufactures of the British Empire, reciprocal tariff relations with other countries—but in no case amounting to equality with the British Empire—and a special tariff on a prohibitive scale against our present enemies. Along with these go suggestions for differential charges against enemy shipping, and other measures calculated to make the general policy outlined more effective, as well as further proposals embodying more drastic provisions in regard to the treatment of enemy subjects. Other leading Chambers also submit resolutions dealing more or less comprehensively with the same complex problem. Generally speaking, they may be summed up as strongly supporting the policy laid down at the Economic Conference of the Allies, and aiming at the removal of the economic conditions which enabled our present enemies to so seriously menace the safety and commercial prosperity of the Empire. Whatever individual difference of opinion there may be on points of detail, it cannot be doubted that the broad lines of policy indicated will be cordially endorsed. It may be added that the agenda of the coming Congress at Capetown, which has just been issued, covers 19 pages, and comprises a list of over 90 resolutions submitted by different branches in the four Provinces, as well as from Basutoland, Bechuanaland Protectorate, Rhodesia, and Lourenco Marques. Several reasons combine to make the forthcoming meeting the most important probably in the history of the Association. Owing to the war, no Congress has been held since 1913, and the present gathering will therefore have to deal with all the commercial questions that have arisen in the past three years; but none of them, plainly, is of more importance than that of future enemy trading in our midst.

SOUTH AFRICAN COAL BY-PRODUCTS.

THE problem of meeting the increased demand for motor fuel which is exercising the minds and taxing the resources of the largest oil producers of the world, is one that may be said to possess a certain amount of interest for industrial economists in the Union of South Africa. The demand for motor fuels is outstripping that for illuminating oils, and it is authoritatively stated that the increasing number of motor vehicles in operation nowadays has brought about a need, which, if it continues to increase at the present rate, will soon far exceed the production by ordinary means which are now commonly in use. So serious does this situation appear that the International Association of Recognised Automobile Clubs recently offered a prize of £20,000 for a gasoline substitute which will cost less than gasoline. The urgency of the position will be understood when it is explained that a large proportion of the world's output of petroleum is of such a character that comparatively small percentages of gasoline and naphtha are produced by the ordinary refining methods referred to. Obviously, a remedy is partly to be found by increasing as much as possible the existing output of crude oil; but it is clear that so far as oil fields are concerned the matter is not one that can easily be arranged. Occasionally the bringing in of a prolific oil field relieves the strain by the great outflow of refinable oil that often follows; but the relief is usually only temporary for the life of a gusher field is somewhat limited. In 1914, for instance, the Cushing pool in Oklahoma, U.S.A., was looked upon with considerable anxiety by the existing oil producers, as a serious competitor in the market. By reason of its vast yield, the average price of crude oil at the well was materially reduced; but within little more than a year the prices of crude oils had nearly reached their former levels, and producers and refiners were looking for new sources of supply. The discovery of other oilfields, therefore, can hardly be looked forward to as a reliable and satisfactory solution of the expensive gasoline problem. There is, moreover, another point that requires consideration. Even if sufficient crude oil could be obtained to meet the needs of the gasoline market the production of motor fuel in adequate quantities according to present methods would result in a concomitant supply of less important and practically unsaleable products, which would very largely off-set the advantages that would otherwise be obtained. In consequence of this position of things it has been found necessary to work out some commercially practicable process by means of which larger yields of motor fuels can be obtained from a given quantity of refinable oils; or, on the other hand, a non-refinable oil may be made to yield these products. Experiments that have been made upon a practical scale in the United States have proved definitely that in both directions there are commercial possibilities that promise to relieve the tension very considerably. Not only so with regard to gasoline, but also with respect to the production of what are called the "aromatic hydro carbons," have these experiments been productive of the most gratifying results. Herein lies their importance from the point of view of South African sources of oil. Hitherto the chief sources of gasoline have been the crude petroleum of the United States, Russia and Mexico, while the sources of the aromatic hydro carbons have been coal-tar, water gas-tar, and the coal gases from by-products coke-ovens. Now, however, it will be possible to use shale oils as well as crude petroleum and coal-tars as sources of gasoline and the other valuable hydro-carbons, and the increased yield of each of these different substances, which will be obtainable from shale oil and coal, makes it clear that a wide field is likely to present itself for the use of the coal which is at present unmarketable in South Africa, and for the oil shales, which have usually been regarded as being capable of yielding lubricating and burning oils, paraffin scale, etc., and as practically useless for the purpose of the gasoline and aromatic hydro-carbon industry. The new uses to which these assets of the Union may be put add very greatly to the potential value, which they already possess. The question of a market in the future is not one that appears likely to prevent any difficulty. Even for the commoner results of distillation that have just been referred to, there is a special opening in this country that is indicated by the fact that in 1915 some £800,000 worth of products, more or less directly derived from crude mineral oil, were imported into these territories, as valued by the Department of Customs and Excise. The supply of

crude oil does not seem to be greatly on the increase. The stocks of crude oil in storage above ground in the States, in spite of the tremendous floods of oil of such fields as that of the Cushing pool, and the famous Maricopa area, have remained more or less constant for several years' past at about 120,000,000 barrels. It represents less than a six months' consumption by refineries. We have already referred to the cry for more gasoline. Five years ago, we are told, the number of motor vehicles in the States alone was about 500,000; now more than 2,000,000 are said to be in actual operation. If the present rate continues the number will be doubled in two or three years. The figures cited do not include the large number of internal combustion engines in operation that use gasoline or naphtha as fuel. It may truly be said that the future requirements of the world in the matter of hydro-carbon products is not capable of realisation. With our magnificent resources in the coal measures of the Union there ought to be a valuable supplement to the returns from our gold mines and the precarious returns of our other great mainstay—the diamond industry.

THE IMPROVEMENT IN DIAMONDS.

A FURTHER improvement in the market for diamonds is a feature of the week's cables, and the reasons therefor have provided a fruitful topic. "The question is often asked," wrote the Amsterdam correspondent of the *London Times* recently, "what is the cause of the increase in the price of diamonds since the outbreak of the war. It is easy to understand why many commodities of daily use and necessity have become dearer—but diamonds? Surely if there is one thing more than another which society, using that word in its widest, and not in its conventional sense, can dispense with, it is diamonds. Yet the fact remains that these most precious of stones have become more precious than ever during the war. Prices dropped for a few months after the beginning of the war, but they have recovered, and now stand at considerably above the normal rates." The correspondent sought the views of some of the leading experts as to the cause of the rise. Messrs. Asscher, the well-known diamond cutters of Amsterdam, explained that the demand now exceeded the supply. The concerns which provided the raw material had informed the trade that there was a dearth of rough diamonds, owing to the interference with production occasioned by the war. Messrs. Asscher added the interesting information that many members of the public, as well as of the trade, were buying diamonds, being convinced that they were a convenient and safe form of investment at a time when many of the world's ordinary securities had declined in value. Confirmation of this was found by the correspondent in a further statement by an Englishman lately returned from Hungary, who had spoken of the extent to which the Jewish population of Budapest were investing their paper money in diamonds and jewellery, while several diamond merchants from Germany and Austria were also stated to have recently visited Amsterdam for the purpose of making similar purchases. This popular confidence in diamonds as a convenient and remunerative form of security, which can be trusted to be realisable, whenever need may arise, on favourable terms, is, of course, nothing new, but—leaving out the question of dealings by Germans and Austrians, whose operations, it may be asked, are being effectually circumscribed—it is satisfactory to find that it is being so conspicuously maintained. As the *Diamond Fields Observer*, however, very justly points out, the real and substantial cause for this gratifying recovery is, of course, to be found, as Sir David Harris's speech the other day showed, in the policy adopted by the large producers of stopping production at a period when there was no demand, coupled with the simultaneous action of the Diamond Syndicate in refraining from the time being from the realisation of its large stocks. No doubt the rapid recovery of the market has been assisted in a material degree by the abounding prosperity, thanks to war profits, in the United States. It has been due in a still greater measure, however, to the essential policy of restriction of production, and careful regulation of supply in accordance with demand, carried out by the larger producers and those who control the feeding of the market, and it is upon this factor, far more than on anything else, that the maintenance of values, and the prosperity of the whole industry, must always and under all circumstances primarily depend.

PHYSICAL CULTURE AND MINERS' PHTHISIS.

[By A. J. BEAVEN AND W. H. MORGAN.]

ALTHOUGH much has been said and written on the possibility of making use of Curative Physical Culture in the prevention and cure of Miners' Phthisis, it yet remains to be as widely adopted on the Rand as it deserves. It is certainly necessary to go further than publishing articles pointing out the benefits of correct breathing, hygiene, etc. The average miner will read such with a shrug of the shoulders and proceed at once to forget all about it. That the disease can be, to a large extent prevented, and in its earlier stages cured by proper breathing, using the whole of the lungs, improving the circulation by judicious exercise, and generally toning up the whole system seems to be now pretty well admitted, and has been shown by its success at the Robinson Deep and certain Far East Rand mines. The writers of this article are convinced that such is the case. When we speak of a cure

other habits of the miner will have to be changed. Their faults and failings are well recognised, and must be treated in that sympathetic manner, that will gain the men's confidence, and so tend towards the elimination of those faults. Whilst the miner has no monopoly of the vices; the dangerous nature of his occupation and the number of lives under his care certainly require a sober, steady, brain and body in order to carry out the work with a maximum of safety. The depressing effects of impure air, gassy atmosphere, lack of sunlight, etc., are well known to those who have worked for any length of time down the mines; and when one further considers that the miner is a fatalist; that he expects to eventually contract phthisis; that he believes it incurable, because so many of his personal friends have died of it; one can well imagine that such a mental attitude



we mean that as a decayed tooth may be filled and made to last a lifetime, so we believe that phthisis can be "held" or "arrested" and the subject enabled to live an ordinary length of life by bringing into regular use those portions of the lungs which have hitherto been neglected. The effect of so doing would also tend to gradually create new life in the fibrous tissue and capillaries, by bringing into play those parts that are at present affected. A person's breathing is not only, as some imagine, a mechanical process like the beating of the heart, but is absolutely under the control of the individual. That being so, it will be understood that a person's manner of breathing is simply "habit," and like all other habits can be changed, provided the individual is taught the right way and is assisted by example to create that strength of will necessary. Unfortunately most miners (and other people) have gradually lost the full powers of their breathing organs. The proper method of breathing will remedy this, gradually becoming habitual, requiring no effort, and almost sub-conscious. The advice recently given by a writer in the *Reef* to practice shallow breathing down the mine and deep breathing on the surface appears to us somewhat ridiculous. To establish one way of breathing for all times and that the proper way, is very often a matter of difficulty, without making it more difficult by spending, say, eight hours a day in forming a habit and another eight in breaking it. To get the best results, many

would pre-dispose a man to contracting the dread disease and also create that desire for a stimulant, to which the miner is so prone. We hope to overcome this desire by removing the mental and physical depression and inertia, by training the subject to become master of himself. We believe that the *mental* conversion of the miners represents a very important factor, and one which in the past, has received too little consideration, or in other words that the psychological aspect must have due attention. It is just as well to fully weigh all the difficulties so that we may be in a position to tackle them in the right manner and with the best hopes of success. To get the miner to take such interest in his own physical well being, will require a deal of tact and hard work, but we believe it can be done. It is not our intention to simply hold a class; give a lecture, and then rush away to other work, but to make ourselves familiar with the lives of the miners, gain their confidence, hear their views and endeavour to improve their outlook, mentally, morally and physically. No one will deny that to improve a man physically, naturally raises his moral and mental tone. The mind being elevated as the body is strengthened, the two acting in concert. It has been remarked with a deal of truth that many a miner will carefully exercise, groom, diet and train his whippet (in fact spend hours on it), but has neither the idea nor the inclination to spend a little time looking after his own health and bodily welfare. This object lesson

must be driven home. With these few remarks, perhaps, disjointed, but representing a combination of careful thought and actual experience we have outlined the following scheme, which might form the basis of discussion:—

1. Lectures and demonstrations on the various mines.
 2. From these, classes would be organised, under the direction, tuition and encouragement of experts.
 3. Miners' classes at, say, 4 p.m., or as soon after shift as possible, so that the men would not have left for their respective homes.
 4. Other classes of surface employees might be arranged for if a sufficient number offered.
 5. A staff class could be held separately. (Later on the best man or men on each mine would be trained as instructors or leaders.)
 6. Sports, competitions, etc., periodically, with suitable events for underground men only.
- Teams might visit other mines and engage them in friendly contests.
7. Social evenings, with little health chats, song, dance etc., to get the ladies interested.
 8. Pamphlets might be issued from time to time for educational purposes, and as an added interest to the movement.
 9. To assist in the carrying out of the exercises and to act as a constant reminder, a chart could be printed, consisting of photographs of the various movements and presented to each member of the class.
 10. Prizes might be given for: (a) Regular attendance (not only at class, but at work); (b) general improvement; (c) for the mine with best attendance at classes in proportion to underground employees, etc.

The co-operation of all mine officials (active wherever possible) would be of the utmost importance. The examination, by the Mine Doctor of any man who showed physical signs of Miners' Phthisis or other weakness, would be neces-

sary, with a view to mapping out a special course suitable to the individual. A full report to be rendered monthly, as to lectures and classes held, and arranged for, numbers attending and a general resume of work accomplished up to date. This being a new idea the difficulty of framing a comprehensive scheme will, no doubt, be understood. Needless to say, it can be altered, amended or added to as experience suggests or necessity demands. Apart from the humanitarian side of the question (the lengthening of men's lives); arousing them to the fact that sobriety and moderation are rewarded by improved health and strength; that the care of one's body is a duty owing to oneself, to the wife and family, and to the community at large. There are other aspects. So far as can be judged at present, the provisions of the new Phthisis Act will mean the withdrawal of a large number of men from the mines. This makes it all the more necessary to increase the working (life) of those left and to prevent the disease getting a hold on the new-comer. To add even one year to the working life of half the miners on the Rand would mean a great deal to both the industry and the men and would represent a considerable saving in the way of Phthisis Compensation. A premium should be placed upon health and not disease; men should be encouraged to keep fit and well as long as possible by the payment of an annual bonus for every year worked over, say, five. (this to be paid by the Phthisis Board), instead of as at present a man being encouraged to contract phthisis as soon as possible for the sake of the compensation. This latter sentence may sound startling, but has much truth in it. The mere fact of men feeling that their welfare is being studied will tend to a better understanding between employer and employee. The toning up of the system and improved circulation of the blood is a fine antidote to "grousing" and brooding over imaginary wrongs. In our opinion the introduction of this scheme represents not only a very important addition to the preventive and eliminative measures already in vogue, but will tap a source of strength hitherto untouched and will also produce in comparison to the small cost the best results.

Oceana Development Company.

The secretary of the Oceana Development Company, Limited, writes to the *Financial Times* as follows: "I am instructed to say that the rumour referred to in your issue of to-day's date that a Kaffir house has taken an option on the Oceana Development Company's farms in the South-Eastern Rand with a view to testing them by drilling is at least premature. At the general meeting, the proceedings of which were reported in your issue of 31st May last, the chairman stated the board believed that before very long arrangements might be made for boring on these farms without cost to the company, but reserving a substantial interest in any company formed to work the properties as had recently been accomplished in the case of the Daggafontein mine. Since then negotiations to that end have taken place, but at the moment can only be stated to have reached a preliminary stage. Immediately any definite arrangement has been reached a communication will be made to the shareholders and to the Press.

The following are the results of the operations of the Swaziland Tin Company, Ltd., for the month of July, 1916: Estimated profit (taking the price of tin at £155 per ton), £784; less adjustments in respect of previous shipments, £8; total, £776. The reduced profit is due to a temporary shortage in the water supply.

The mineral output of the Territory of the Campanhia de Moçambique (Manicaland) for the month of July, 1916, was as follows: Reef—Mill: Gold won (fine), 53ozs. 10 dwts. 5 grs.; tons crushed, 207 dwts.; value, £221 15s. 3d. Alluvial: Gold won (fine), 1,116ozs. 10 dwts., 14 grs.; cubic metres dredged, 83,755 dwts.; value, £4,628 9s. 5d.

Telephone or Signal Bells at Mines.

A number of mines have underground telephones connecting with engine houses, landings, offices, etc., so that in case of accident or emergency the telephone is used. Other mines have repeat bells, so that whoever is ringing the signal will be able to hear the bells he is ringing as well as feel the electrical push button; the same signal that is sounded in the engine-room will be sounded at the landing and at the various levels at the same time, so that there is less liability of mistake if the bells are not working right. Two separate signal lines should be in every shaft, preferably of different kinds—as the telephone and electric bell line, or the electric bells and the old-fashioned knocker line—so that if one bell suddenly fails there is an auxiliary or relay signal line ready. In some of the Western mines of America (says the *Mining and Engineering World*) they use the electric lights as an auxiliary signal system; when the bells fail they flash the signals; the lights are switched off and on the same number of times that the bells would be rung, this method only being used in an emergency. This method requires the underground lights to be on the same circuit as the lights in the engine-house, so that throwing a switch at any station flashes the signal to all the other stations, as well as to the engine-house; or if the engineer does not understand a signal he can flash for a repeat signal. In the Doleoath tin mine, in Cornwall, they have a system using electric lights and numbers. When a gate is thrown in for the skip or cage to rest on in the shaft, a circuit is made with the engine-house, and a red light burns in a box set up before the hoisting engineer. This red light illuminates the number of the level in the shaft and designates where the gate is thrown across the shaft; all numbers representing other levels where the shaft is clear being shown by a white light. If the signal given to the engineer does not correspond with the signal code for the level as shown by the red light before the engineer, or if a gate is left in and the skip signalled to a lower level, the red light illuminates the number of the level where the gate is still across the shaft. This shows the engineer at the throttle that the shaft is not clear; consequently he does not obey the signal, but waits for a telephone message from underground and knows the shaft is clear before moving the skip or cage. Two separate distinct signal lines are an economy as well as a means of accident prevention, for the delay and loss consequent upon tying up a hoisting plant while a signal line is being repaired will usually pay for several signal systems, while if there were two separate systems the hoist need not be delayed when one gives out. There should also be a standard code of signals for all mines in any district, so that skip-tenders, landing-men and engineers changing from one mine to another would be familiar with the signals in use. The printed code is usually framed and hung up in sight of the bell-men, but it occasionally happens that the man cannot read English, and so relies on his memory as to which is the correct signal to give.

MINES AND RAILWAYS IN RHODESIA.—II.

Important Memorandum Issued by the Mining Industry —Change of Policy Demanded.

Sufficient has, it is thought, been said under this heading to show that the country generally, being supremely dissatisfied with the results of the methods adopted by these railways, is entitled to ask that more consideration be given to the development of the country's resources, which will in itself bring about the betterment of the financial position of the railways. That the British South Africa Company stands to profit most by the prosperity of the railways goes without saying. The value of its land and mineral rights have increased naturally by the railway penetration, and it may, in these circumstances, reasonably be asked if Southern Rhodesia is to remain in a water-logged condition industrially until past deficits are liquidated, or if it would not be a more far-sighted policy to deal with the deficits in some other way and spend their repayment over a long term of years, in order that some progress may be made in the development of the potential industries of the country. As an example of the detrimental effect of the high railway rates in the past the Chambers assert on the best authority that one of the financial groups would have been able to bring to the producing stage at least one more mine, had its capital resources not been called upon to such a large extent in paying excessive railway rates on the equipment required by five other large mines.

RAILWAY RATES ON ORES.

The industry is desirous of arriving at a definite understanding with the railway companies in the matter of railage on mineral ores. It maintains that the present system of fixing the rate *pro rata* to the assumed value of the mineral conveyed, while it may be considered by the owners of railways in other countries applicable to the situation on the principle that all traffic is supposed to carry the rate which it will bear, is inconsistent in Southern Rhodesia where a royalty is charged by the owners of the minerals, who also hold the control of the railway trust, whether the mineral will bear the royalty or not. The industry, therefore, is expected to pay both a direct and an indirect tax to the owners of the minerals in the form of (1) royalty on gross production and (2) profits tax to the railways. The broad question of the amount of taxation which the base mineral industry is able to bear was discussed at very great length with the directors of the British South Africa Company in the year 1907, and the existing scale of royalty was then arrived at. As the products of this country which are exported have to compete in the markets of the world, it stands to reason that railway charges must be fixed at a minimum scale if such competition is to meet with success. Yet the rates on ores of most descriptions are so high as to act as a direct discouragement to capital. The general principles on which the Chambers object to these rates are:—(1) That they are based on the value of the ore; (2) that they are quoted as for the marked carrying capacity of the trucks; (3) that they are subject to the objectionable system of bargaining whereby one producer may obtain more favourable terms than another. Attention is drawn to the fact that the rates on ores and minerals for export are stated in the tariff book of the South African Railways. On reference to the tariff book of the Rhodesian Railways, however, it is only ascertained that rates will be quoted on application. So far as the experience of the Chambers goes, the rates "quoted on application" are from 60 to 200 per cent. upwards higher than those stated in the South African Rail-

ways tariff book. In a country like Rhodesia, wherever any (even slight) prospect of development is shown, the railway companies should be content with a very low margin of profit and take into consideration the fact that the industry has, as already stated, to compete in the markets of the world with other countries more favourably situated. Opinion has been voiced by the railway directorate that the affairs of the companies should be considered not separately but together. As the railways are separate entities and with debenture holders foreign to each other, it is very apparent that a fusion of interests could not be effected without their respective consents, and unless a safe guarantee were forthcoming it is highly improbable that a merger could be carried through. From the Mashonaland Railway, concession rates can be scarcely looked for, unless it can be proved that the ores to be shipped or conveyed from a point to a point are of sufficient quantity to warrant a rate that will ultimately bring paying revenue to the road, and benefit to the worker. The Rhodesia Railways are at the moment happily positioned, and if the interests of each system are so interwoven it appears that this undertaking could assume the roll of benefactor to its allied corporation as well as to the peoples whose areas are served by it. The deferring of dividends by this company and the appropriation of such available funds, would produce financial aid which is so sorely needed if new industries are to be set up, the success of which must bring material traffics to the railroads of these territories. A very low or even free mineral rate to new base metal workers, who without a freight bonus find it financially impossible to ship test tonnage, is suggested. Such free rate over the Rhodesia Railways might if conceded add to the revenue of the Mashonaland Railway over whose lines the product would be partially hauled, and at the same time give assistance to the worker to prove his proposition commercially. While the rating of freight based on its ability to meet such charge is the method adopted by the railroads of the world, payable turnover is the secret of all business success, and if by the earmarking of a portion of the surpluses of this corporation grants can be made by way of preferential rates to push industrial expansion, which is vital and necessary to the welfare of the country, then capital and population may be attracted. The railways and other commercial interests of the British South Africa Company are so correlated that failure of one means the doom of the other. The patriotic view of the matter might also receive a little consideration. In Rhodesia to-day claims are held for the following base metals and minerals which are urgently needed by the Imperial Government and its Allies for munitions work:—Chromite, copper, tin, iron, asbestos, lead, wolfram ores, magnesite, nickel, antimony, mica, tantalum. Recent investigations by the most reliable authorities indicate that there is prospect of early development for export of the following items in addition to those stated above, provided railway rates are favourable:—Vanadium, graphite, timber, salt, pyrites, barytes, talc, arsenic, molybdenite, bismuth. As a rule when a reduction of rates is asked for the following questions are asked:—(1) Whether a reduction will so stimulate traffic in any particular article as to recoup the railways for the reduction. (2) Whether a reduction of rates would actually make any material difference between profit and loss. Such enquiries as these, however, are hardly pertinent to the present position in regard to the undeveloped base mineral wealth of Southern Rhodesia. Nevertheless an emphatic reply is possible in both cases. (1) If the rates are not reduced to a reasonable figure and quoted in the tariff book, no traffic will result as the minerals will not be developed nor shipped. The question of recouping the railways for any shortfall of revenue resulting from the reduction does not therefore enter into the calculation. (2) In two instances brought to the notice of the Chambers a reduction of a third of a penny per ton per mile on the railway rate made the whole difference between profit and loss. The railway companies must surely understand that the Chambers, as representing the industry generally, desire that the fullest advantage should be taken of the present unsatisfied demands for many of

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the minerals which Rhodesia can produce. It is in the circumstances incomprehensible that the policy of the Board should apparently be one which, far from being satisfied with a fair margin of profit over cost of carriage in order to increase traffic and stimulate production, bases its rates of a system which the Chambers cannot admit is applicable to Southern Rhodesia.

INSTANCES OF CHARGES.

In order to bear out their assertion that the present system of fixing rates is unreliable, and, as stated above, based on principles inapplicable to conditions prevailing in Rhodesia, the Chambers quote the following instances which have recently been brought to their notice:—(a) Antimony. A producer in the Gwelo district (Gothic Mine) shipped 28 tons of this ore, which is in special demand. The rate quoted was 1'35d. per ton per mile as compared with '296d. per ton per mile, the rate which would have been charged in the Union. The consignor paid for a little over two tons which he failed to load—£7 17s. 6d.—being fined this amount as the ore was loaded in a 30-ton truck, notwithstanding the fact that, on the General Manager's own admission, "we have rarely consignments of traffic going from Gwelo to Beira." The consignor had to meet a heavy loss on the ore and, on the case being represented by him to the Rhodesia Chamber of Mines, a refund of '35d. per ton per mile was made to him by the railway company, thus leaving the rate at 1d. per ton per mile, or 200 per cent. higher than the Union export rate for this ore. The Globe and Phoenix Gold Mining Co., Ltd., thinking that this rate was fixed at 1d. per ton per mile then applied for a quotation. The mine is situated on the rail 42 miles nearer Beira than Gwelo whence the Gothic shipment was made. The quotation given by the railways was 65s. per ton to Beira—2s. per ton higher than the original quotation in the Gothic case. The manager on replying that he did not intend to ship was thereupon asked by the General Manager of Railways to inform him what rate he was prepared to regard as satisfactory. (b) Magnesite. Mr. R. G. Thomas wished to rail magnesite from Gwanda to Johannesburg. Not finding a rate quoted for the ore in the tariff book, he made personal inquiry at the railway office and 39s. 6d. per ton was quoted. This rate excluded all possibility of success, as it would have cost the consignor 25s. per ton to deliver on rail at Gwanda. On the Chambers taking the matter up with the railway company a "special rate" of 26s. 9d. was quoted. (c) Copper ores. A claim owner in Mashonaland desired to rail copper ore for treatment at the Falcon Mines. A rate was quoted of—say, £1 per ton. On his desiring to rail, however, he was informed that this rate applied only to ore of a certain grade and higher quotations were given for ore exceeding this grade. This is an instance of a sliding scale of profits tax. (d) Native timber. The railways were asked to quote for the conveyance of sawn timber, scantling, etc., from Sipopoina Siding to Johannesburg and Capetown. The rate quoted for native rough sawn timber in full truck loads, i.e., full marked weight carrying capacity of the trucks was:—To Johannesburg, £2 4s. 4d. per ton; to Capetown, £3 7s. 8d. per ton. In order to take advantage of the rate, therefore, the consignor would have been obliged to pay on the marked capacity of the truck irrespective of actual weight, and he replied that as his prospective customers might require small lots of sawn timber it would be unnecessary to go further into the matter unless the minimum weight was reduced to one ton. This the railway companies find themselves unable to do. The firm that is endeavouring to establish its business naturally complains that the policy of the

railways hampers it in its efforts to find a market for small quantities, as the rate for such would work out at from £5 15s. to £7 16s. per ton to Johannesburg and Capetown respectively. As the minimum for this class of traffic on the South African Railways is 25 lbs. the minimum of 15 tons quoted by the Rhodesia Railways is out of all proportion, and only has the effect of discouraging export and losing traffic. (e) Salt. Common or rock salt is quoted in the tariff book at Rate 4 with a five ton minimum. Imported salt is quoted from Beira to Congo border at 121s. 11d. per ton. The effect of these rates is seen as follows:—Beira to Congo border, 1,463 miles, 121s. 11d.; Wankie to Congo border, 576 miles, 140s. It can readily be realised that so long as preference to imported salt is given on such a scale as is shown, the many excellent salt pans in the country will remain undeveloped.

SUGGESTED IMMEDIATE REVISION.

Sufficient has been quoted to show that full enquiry is needed into the whole question of rates and traffic in this country and their relation to the development of industries, but in the meantime the Chambers suggest the immediate abandonment of the existing restrictive policy. In order that possible producers may be encouraged to reap the fullest advantage of the existing high prices of minerals in the markets of the world, it is suggested that the combined revised rates for ores on the Beira and Mashonaland and Rhodesia Railways should approximate to the following charges per ton per mile:—Salt, antimony, lead ore, iron ore and iron oxide, magnesite, zinc-blende, lead, zinc oxide, mica, chromite, asbestos, barytes, arsenic, pyrites, '296d. per ton per mile. Conceding the fact that more handling may be called for, a slightly higher rate is suggested for the following minerals:—Copper, tin, wolframite, nickel, tantalum, graphite, litharge, '6d. per ton per mile. The Chambers are convinced that only by the adoption of a broad and bold policy will the fullest advantage accrue to the Empire and its Allies, the British South Africa Company, the railways and the industry on which so much depends.

New Companies.

LIST OF COMPANIES, JULY, 1916.

- Industries, Limited, 186, Stock Exchange Buildings, 64, Fox Street, Johannesburg; capital £1,000 (private company).
- The Guy Fawkes Tributing Syndicate, Ltd., 1, Norwich Union Buildings, 90, Fox Street, Johannesburg; capital £3,500 (private company).
- Dawoods, Ltd., 110, Church Street, Bethal, Transvaal; capital £4,000 (private company).
- Meat Exporters (South Africa), Ltd., 81, Cullinan Buildings, Simmonds Street, Johannesburg; capital £10,000 (private company).
- The Rand Commercial Agency, Ltd., 30, Goodman's Buildings, 87, Commissioner Street, Johannesburg; capital £1,000 (private company).
- Bellevue Colliery Co., Ltd., 36/9, Steytler's Buildings, 42/44, Loveday Street, Johannesburg; capital £5,000 (private company).
- African Iron and Steel Products, Limited, 11, Norwich Union Buildings, Fox Street, Johannesburg; capital £9,000 (private company).
- The Standard Brass Foundry, Limited, 47, Market Avenue, Benoni; capital £5,000 (private company).
- The Standard Motor Works, Limited, 229/231, Pretorius Street, Pretoria; capital £14,000 (private company).
- Bhushkay Brothers, Limited, 42, Market Street, Krugersdorp, £1,000 (private company).
- Christiane Asbestos Company, Limited, 10, South African Mutual Buildings, corner of Harrison and Commissioner Streets, Johannesburg; capital £3,500 (private company).
- W. J. Hammon and Company, Limited, 7, Beacon Road, Doornfontein, Johannesburg; capital £5,000 (private company).
- The Smallholdings Company, Limited, 5, Meischke's Buildings, Harrison Street, Johannesburg; capital £100 (private company).
- Die Afrikaanse Koffiebuis, Beperk, Erasmusgobouwen, Kerkplein, Pretoria; capital £100 (private company).
- Steins, Limited, corner Millbourn and Liddle Streets, Bertrams, Johannesburg; capital £1,500 (private company).
- Cedarfont Labour Association, Limited, Cedarfont, District Standerton, Transvaal; capital £50 (private company).
- The Gardens Tea Rooms, Limited, 72, Market Street, Johannesburg; capital £500 (private company).
- Ismail Cassim and Ahomed, Limited, 226 Market Street, Johannesburg; capital £1,500 (private company).

MINING EXAMINATIONS.

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RHODESIAN MOLYBDENUM, TALC AND TANTALITE.

With Notes on Other Mineral Occurrences.

MOLYBDENUM is in particular demand at the present time for the manufacture of special varieties of steel. The marketable ores are molybdenite (molybdenum sulphide) and wulfenite (molybdate of lead). The latter mineral has not been discovered in Rhodesia. The former has been recorded from a number of localities, but nowhere in any quantity up to the present. Specimens in the Rhodesia Museum come from Glenville, near Bulawayo, from the Antelope Mine, and from the Kimberley Mine. It is also recorded from the Hay Mine and neighbouring properties. It has recently been discovered near the Umfuli River and in the country west of Gatooma. These latter discoveries are being prospected. Molybdenite occurs in leaden grey flakes, which mark paper like graphite. It is usually found scattered in flakes and small nests through pegmatite dykes and veins, especially pegmatites with much quartz. Near the surface it is usually oxidized to molybdic ochre, a pale yellow earthy mineral, which resembles bismuth ochre. In New South Wales the rich occurrences of molybdenite which have been mined have the form of "pipe veins" and are situated near the edge of granite masses. On account of its softness and flaky nature it has always been difficult to concentrate molybdenite. It is stated that these difficulties have been successfully overcome by the use of the oil-flotation process, and that ore carrying only $\frac{1}{2}$ per cent. of molybdenite is being profitably worked in Norway. Concentrates containing 80 to 90 per cent. molybdenite are now valued at £5 5s. the unit. A 90 per cent. concentrate, therefore, is worth £472 10s. a long ton.

TALC.

Talc is a mineral which has very many uses in the arts and industries, the prepared article being generally known as French chalk. It is quite a common mineral in Rhodesia, occurring in large bodies in a more or less pure form (soapstone). It has been found possible to start an export trade from the Transvaal to Europe since the war began, £8 to £40 a ton being received for the ground mineral according to quality. If a large body of pure talc-rock, which would require no treatment beyond grinding and bagging, could be found near a railway route, high railway rates would appear to be the only obstacle to the establishment of an export trade. The world's consumption of talc is increasing, and the United States, although the largest producer, yet imports the finer grades. Large and increasing quantities of talc are used in paper manufacture and in the preparation of cotton fabrics. For the former the fibrous variety is required, and it is known to occur in Rhodesia. At the same time the local talc might replace the imported article in several directions. Talc is required in the manufacture of paints and distempers, and there is no doubt an opening for a local industry in this direction. It might replace the French chalk imported for use in the tyres of motor cars and bicycles, the demand for which, if not large, is persistent and increasing. Talc is the chief ingredient of many toilet powders, for which again the demand is permanent. If talc were produced locally it is very probable that other uses would be found for it *e.g.*, in the soap factory, and in numerous other uses to which French chalk and soapstone are put.

TANTALUM ORE.

The presence of two tantalum minerals was noted in the Victoria tin field (about 35 miles east of Victoria) during the time that active prospecting was proceeding there in 1911. One of these—tantalite (niobate and tantalate of iron and manganese)—occurred in coarse radiating masses of heavy black crystals, which suggested that a fair quantity of the mineral might be present. Specimens seen weighed up to 3 lb. and were said to come from quartzose pegmatite veins. Nothing further has, however, been heard of the discovery; but it would appear worth while for prospectors in the dis-

trict to devote further attention to the mineral. Tantalite is a mineral of variable composition. It passes by insensible gradations from normal columbite (the nearly pure niobate) to normal tantalite (the nearly pure tantalate). Tin, zirconium and manganese are generally present, partly replacing one or other of the metals in the mineral. Tantalite contains up to about 80 per cent. of tantallic oxide, whilst columbite contains up to about 80 per cent. of columbic (niobic) oxide. The weight of the mineral is a serviceable guide to its tantalum content, since it increases with the percentage of that metal; thus columbite has a specific gravity of about 5.3, increasing to 7.8 as pure tantalite is approached. It is not always easy to distinguish tantalite from tinstone, with which it is commonly associated, and it may not always be readily separated by gravitational methods. Tantalum is used as a substitute for the carbon filament in incandescent electric lamps, tantalite being the chief source. This is the only practical use to which the metal has, so far, been put. A few years ago the tantalum filament lamp promised to be in great demand, but it appears to have been superseded by other metallic filament lamps, notably the osram and tungsten filaments, which, although their lasting power is about the same, consume less power. Nevertheless, there is still a demand for the tantalum lamp. It is also known that tantalum can be used for hardening steel. Columbite appears to have no commercial value at present. Tantalite is treated by the British Thomson-Houston Company, and the firm of David Gething, Landore Copper Works, Landore, S.O. Glamorganshire, are buyers of the ore. The price of tantalum ore fluctuates. The requirements a few years ago were stated to be not less than 60 per cent. tantallic oxide, not more than 3 per cent. columbic oxide, and freedom from chromium. Such ore was valued at about 10s. a lb.

BARYTES.

The occurrence of masses of barytes (barium sulphate) has been known for some time in the country west of the railway between Que Que and Hunter's Road Siding. This has recently been examined by the Geological Survey and found to be of considerable extent. One of the largest masses noted is more than 300 feet long and averages about 20 feet wide. Assuming a downward extension of the barytes exposed of only three feet, the amount in sight in this one body exceeds 2,000 short tons. Quartz is the commonest impurity, but it appears possible to select large bodies of pure crystalline barytes suitable for all the purposes to which barytes is applied. The pre-war price of barytes in England was only 25s. a ton for ore containing 96 per cent. barium sulphate, and not more than 1.5 per cent. of silica; but it is probably much higher now, since barium sulphate as a chemical is quoted at £5 10s. a ton in London. There are possibilities of a local demand for the mineral for use in the paint trade, and enquiries are being made as to the demand for it in the Union of South Africa, where the mineral might be applied to various uses. It is thought that an increased local demand might justify the quarrying of the mineral. The deposits lie within two miles of Gado Siding.

GRAPHITE.

Several deposits containing graphite are known to occur in the Territory, and some appear to be of large size. Although a sample sent to England by the Geological Survey for valuation was reported on unfavourably for export, it is probable that this graphite could be manufactured locally and replace the imported graphite compositions used for packing and lubrication. Practical tests are now being made on local material with a view to producing a dry flake graphite and a graphite paste or antifriction grease. If these tests are successful, the deposits will be examined to ascertain the probable quantity of graphite available.

*From the Report of the Rhodesia Munitions and Development Committee.

THE SMELTING OF TIN CONCENTRATES.

Points in the Practice of Different Producers.

As a preliminary to the drafting of a specification by the American Society for Testing Materials, a paper was submitted by Messrs. L. Addicks and W. A. Cowan at a recent meeting of that body. The authors remarked that in tin smelting the purity of the final product depends largely upon that of the original tinstone, so that certain deposits have come to have a reputation as producers of high-grade tin. At this writing, continued the authors, electrolytically-refined tin is just beginning to appear on the market in quantity from the treatment of fowl bullion produced in the usual way from Bolivian concentrates. Electrolysis, of course, should obliterate the past history of the crude tin. It has been the fixed policy of the Dutch and English colonies to smelt the tin concentrates at the point of production, export duties having been imposed on tin ores. Prior to the war, the Bolivian concentrates were sent to England and Germany, where they were worked into a low-grade tin. They are now coming chiefly to the United States, and the crude tin obtained therefrom electrolytically refined as stated above. Up to this time it has been impossible to buy the desirable Straits and Banka products which make up the bulk of the high-grade output except upon reputation by brands, and the sales in America have been handled by brokers who are practically subject to the dictation of the Dutch-English ring controlling those brands, in spite of the fact that this country consumes 45,000 tons a year, or over a third of the world's production. The recent importation of Bolivian concentrates and their local treatment, it is to be hoped, will alter this. According to the rules of the London Metal Exchange, tin is merchantable as standard tin only when the warrant is accompanied by analysis certifying that the metal contains either 99.00 or 99.75 per cent. of pure tin, according to whether the quality is that of a common tin or refined tin, and also that it is of the correct physical condition. Straits, Australian, English Refined, Banka and Billiton fall within the highest class, namely, refined tin. The Chinese tins are "off-grade," carrying considerable lead, and the German tins, resulting from the smelting of Bolivian concentrates, are very foul. Off-grade tins are sold on the basis of a sliding scale for tin content. The worst of them will run over 90 per cent. tin, while the high-grade tins will run 99.8 to 99.9 per cent. The only tests

required for good merchantable tin aside from its origin are that it shall run at least 99.75 per cent. tin, and that a bar when nicked and bent double shall not crack. The consumer has generally met the situation in which he finds himself by buying a first-class brand, analysing it when he gets it, and then sorting the lots by analysis for certain uses. It is of doubtful value to give here a long list of analyses of different brands, but a rough idea of the various grades will illustrate the situation:—

TABLE I.—Analyses of Different Brands of Tin—All Values in Per Cent

Elements.	Straits Banka	Billiton.	Australian.	English Common	English Refined.	Chinese.	Bolivian
Tin	99.80-99.95	99.75-99.90	99.2	99.9	95-99	93	
Antimony	0.02	0.04	0.25	0.04	0.02-0.40	4.0	
Arsenic	0.04	0.06	0.06	0.05	0.06	0.2	
Bismuth	None	0.003	0.06	0.001	0.01	0.1	
Copper	0.01	0.04	0.08	0.015	0.09	0.5	
Iron	0.03	0.03	0.004	0.002	0.15	0.02	
Lead	0.02	0.04	0.36	0.01	0.3-4.0	2.7	
Zinc	0.03	None	0.006	0.01	None	0.03	

The impurities in tin may cause trouble by poisoning, as in the case of pipe and tin cans; by impairing fluidity, causing an excessive consumption of tin used for coating, or making solder hard to apply; by fouling an alloy and spoiling its appearance; by impairing the ductility of alloys which have to be worked, such as bronze or Britannia metal; by causing local galvanic action and possibly "tin pest"; and by affecting the melting point of fusible alloys. One of the tinplate manufacturers states that lead makes a mottled finish, iron causes rough surface and impairs fluidity, and arsenic and zinc tend to form poisonous salts. They suggest maximum allowable percentages as follows: Lead, 0.04 per cent.; copper, 0.02 per cent.; iron, 0.05 per cent.; arsenic, 0.05 per cent.; antimony, 0.02 per cent.; zinc, 0.05 per cent.

Capital and Labour.

At the annual meeting of the shareholders in Petters, Limited, of Yeovil, on June 14th, Mr. E. W. Petter, the chairman, said: It has become the custom lately, in addressing shareholders in public companies, for the chairman to allow himself a little latitude in going outside the actual business of the meeting to express some personal views on matters of interest, and having now finished with the items of the report, I will, with your kind indulgence, avail myself of that licence. I would like to ask each one of our shareholders and others whom, possibly, my words may reach, to think carefully over this question: "How is this country going to restore the wealth it has lost through the war?" I believe the answer to this question is, next to victory, the most urgent problem that we have to consider. It is a platitude to say that the only source of new wealth that a community possesses is in the productive work of its people; but if that is so, then the only way to restore the ravages of this war is to obtain the greatest possible amount of production in the factories and from the land. How is this to be done? Principally by increasing the number of skilled workers in the country. Before the war, out of some 15,000,000 manual workers, male and female, only about 4,000,000 were represented in the skilled trades organised into trade unions. The remaining 11,000,000 were unorganised and to a large extent unskilled. It is to the improved education and training of this latter class that we must look for improvement in our producing capacity, and this is the class that has in a sense benefited from the war. Formerly living in that condition which Professor Bowley designated primary poverty, they are now the principal recipients of the immense sums disbursed in separation allowances, and they are, in consequence, enjoying conditions of comfort and security to which they were heretofore strangers, and from which I trust they may never be recalled. But this can be brought about by no magic touch of a statesman's wand, and only by raising them from the ranks of the unskilled into those of skilled workers. In doing this one of the greatest obstacles to be overcome will be the opposition of the skilled labour organisations, but I am not unhopeful, once the whole problem is reconsidered fundamentally, that the vested interest of the skilled trades will give place to the real interest of the community, neither am I fearful of the result upon any of the parties concerned. A second question now arises: Are the industrial conditions at present existing in this country likely to be favourable to the maximum of production being obtained from the working community when the war is over? I fear that anyone who knows anything about these conditions can only answer this question in the negative, and yet in the production of wealth—I am not speaking now of its distribution—the interests of workers and capitalists and that other class which it is so difficult to define, the class responsible for direction, forethought, enterprise, the capacity to plan, the skill to design, the nerve to execute and the genius of mind and character to carry through, call it what you like—management is the word which, to my mind, most nearly indicates what I mean—I say the interest of these three classes are identical and inseparable. The reassertion of this truth is, in my opinion, the

first step towards better things in the industrial world, because when people get it into their heads that other interests are antagonistic to their own—as has been the case for at least a generation between what has been commonly called Capital and Labour—they do not attempt to understand one another's difficulties and the tendency is always to drift farther apart. On the other hand, when it is recognised and admitted that the interests are identical, then if people are wise they endeavour to understand, to sympathise with, and as far as possible to remove one another's difficulties. The recovery of our country from the financial consequences of the war will be dependent upon the following conditions:—Firstly, there must be no limitation on production, whether it be caused by the operation of trade union regulations, by controlling the number of apprentices entering skilled trades, or by any other circumstance. Secondly, there must be no idle hours due to strikes or stoppages of work through labour disputes. And, thirdly, the only way to ensure the first two conditions is to provide such economic conditions in this country and by mutual agreements with other countries as shall ensure an unlimited outlet for the productions of the people, so that the workers of all classes may be properly housed, fed and clothed, and freed from anxiety as to the continuity of their employment. Lastly, means must be devised to ensure that the workers receive a fair share of the fruits of their labours, and enjoy the products of civilisation, to the progress of which they are the largest contributors. Are we going back to the conditions existing before the war? Is the war abroad merely an interruption in the civil war between labour and capital at home to which both parties are to return as soon as circumstances permit? If so, then I say that all the sufferings and the losses which we have endured since August, 1914, will have been in vain as far as their influence upon our national character is concerned. In my humble opinion, the war saved us from something even worse than itself, and I refuse to believe so ill of my fellow-countrymen as to think that when we shall have been delivered by the mercy of God from the peril without, we are going to return to a state of affairs even more perilous within. Nevertheless, if we do not prepare for something better that is what awaits us. Preparations are being made to carry on the strife on lines infinitely greater than those of which we have had any experience in the past, and unless some voice makes itself heard counselling other measures nothing can avert it. Surely it is not beyond the wit of man to devise means of reconciling interests which are not inherently antagonistic, but which are really inter-dependent, and upon the harmonious working together of which the whole future of our race depends. Is it too much to hope that before it is too late this problem may be approached from all quarters with minds dispossessed of preconceived ideas, with a view to founding upon a basis of mutual good will and equal justice a new scheme of relationship between labour, management and capital that will enable the great work of restoration of our national fortunes to proceed unhindered by jealousy or internal strifes, and permit the producing classes of the community to take their proper high place in the order of the new after-war civilisation, instead of being the shuttlecock of circumstances largely engineered and brought about by darkening and parasitic influences.



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S.-W. TRANSVAAL DIAMONDS: JULY RETURNS.

THE returns for July month of diamonds found in the diggings of the South-Western Transvaal show a grand total of 3,261 carats, value £19,533 5s., which is well up to the average of the preceding months of this year, the monthly figures having been:—

	Carats.	Value.
January	2,486 $\frac{1}{4}$	£11,818 7 0
February	3,606 $\frac{3}{4}$	20,970 10 6
March	4,041	20,632 16 0
April	3,592 $\frac{3}{4}$	18,465 0 0
May	3,877 $\frac{1}{2}$	20,141 15 6
June	3,461 $\frac{1}{4}$	20,822 6 6
July	3,261	19,533 5 0

THE PRODUCING AREAS.

The producing areas totalled 49, and were as follows (those in the Bloemhof district being given without distinguishing mark; those in the Wolmaransstad district with*, and those in the Potchefstroom district with†:—

	Carats.	Value.
London	633 $\frac{1}{2}$	£3,705 2 6
Dievedraai	418	2,703 2 6
Bloemhof	417 $\frac{3}{4}$	2,333 10 0
Schweizer-Reneke	225 $\frac{1}{4}$	1,444 2 6
Goedehoop	117 $\frac{1}{2}$	980 0 0
*Kareepan	82	808 0 0

	Carats.	Value.
Kromellenboog ...	139 $\frac{3}{4}$	778 2 6
Plessisdam	96	497 5 0
*Klipkuil	91 $\frac{1}{2}$	494 10 0
Panfontein	73 $\frac{1}{2}$	421 17 6
Christiana	78 $\frac{1}{2}$	379 12 6
Cawood's Hope ...	47	348 15 0
Koppiesvlei	81 $\frac{1}{4}$	342 5 0
Kameelkuil	39 $\frac{1}{2}$	312 10 0
Rietput	43 $\frac{1}{2}$	285 5 0
Zevenfontein	51 $\frac{1}{4}$	273 0 0
Blesbokfontein ...	47 $\frac{1}{2}$	266 10 0
†Goedgenoeg	27 $\frac{1}{4}$	229 12 6
Kafferspan	52 $\frac{1}{2}$	229 10 0
Eerstebegin	31 $\frac{1}{2}$	209 10 0
Mooifontein	42 $\frac{1}{4}$	208 0 0
†Eastleigh	32	207 15 0
Diamantdoorns ...	22	198 10 0
Grootpoort	35 $\frac{1}{4}$	192 10 0
Mimosa	27	182 15 0
*Doornbult	29 $\frac{1}{2}$	181 15 0
*Leeuwfontein ...	27 $\frac{3}{4}$	151 10 0
*Rondevlei	17	149 0 0
Leeuwbosch	15 $\frac{3}{4}$	144 0 0
*Boschplaats	32 $\frac{1}{2}$	131 2 6
Kareepan	15 $\frac{3}{4}$	108 10 0
Katdoornkraal ...	23 $\frac{3}{4}$	103 15 0

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THE WEEK IN THE SHAREMARKET.

Roumanian Boom and After—Sub Nigel Fluctuates—Few Special Features.

THE market presented no special features on Friday and Saturday, beyond the continued advance of Sub Nigels. On Monday they were again a strong feature, and there was a distinct advance in Consolidated Lands. Modder B.'s went back and were offered on a sixty day credit at the recent buying price. Once again they changed positions with Modder Deeps, which are now ahead. Kleinfonteins were an active market recovering to the level of their recent rise. Brakpans were decidedly weaker. Zaaiplaats, which have been gradually falling away, have now reached the level of Lace Props and Sallies. The Roumanian news gave the market a strong spurt on Tuesday morning, starting with another run on Sub Nigels which had slackened off over night. At the call there were advances in Bantjes, Kleinfonteins, Government Areas, City Deeps and Brakpans. The optimistic feeling was manifested by the general desire to pick up stocks from London. The spurt did not last long, and the market sagged all through the afternoon. Wednesday morning brought no relief, and Springs, Sub Nigels, Government Areas and Kleinfonteins were shorn to the extent of 1s. to 1s. 6d. each of their yesterday's gains. There was a slight betterment in African Farms. In the small stocks Frank Smiths were appreciably higher. At the close the market hardened somewhat. On Thursday morning Brakpans and Bantjes advanced, Kleinfonteins were also harder. Sub Nigels were given a rest, and no business was put through in Government Areas. The Modder trio were in demand at enhanced rates. Robert Victors made a re-appearance above a long period of neglect, with sales of a few hundred shares ex London at 10s. The market weakened in the afternoon with the exception of New Modderfonteins, which established a new record at £18 12s. 6d. sales. On Friday morning Sub Nigels went weak, falling to 25s., but rallying on call to 26s., at which price they closed buyers. Bantjes at 17s. were also easier, and so were Brakpans at 91s., 93s.; New Modders at £18 7s. 6d. buyers for cash and £18 10s. ex London. The following were to the good: Gedulds at 43s.; Government Areas at 46s. 6d. sales; Modder B.'s at £6 16s.; Modder Deeps at £7 1s.; Consolidated Lands at 18s.; and City Deeps at 86s., all buyers. In the small stocks, Rand Klips were active and some large parcels changed hands at 9s.; Cloverfields at 8s. 9d. have also proved a satisfactory investment. Very little has been doing in unlisted stocks. New Daggafonteins rose during the week to 26s. 6d., closing at 25s. 6d. Some trifling business was done in Henderson's Options at 1s. 3d. to 1s. 6d.

	Fri., 25th.	Sat., 26th.	Mon., 28th.	Tues., 29th.	Wed., 30th.	Thurs., 31st.
African Farms	8 6	8 6*	8 6*	9 0	9 1	9 0*
Apex Mines	5 0*	5 6*	5 6*	5 6*	5 6*	5 0*
Anrora Wests	—	—	—	—	14 0*	14 0*
Bantjes Cons.	16 6	16 9	16 6	17 1	17 0	17 5
Blaauwboosch Diamonds	65 0*	65 0*	—	65 0*	—	—
Brakpan Mines	85 0*	89 0	87 6	89 6	91 0*	92 0
Breyten Collieries	19 6*	20 0*	19 0	—	—	—
Brick and Pottery	—	—	—	—	5 0*	5 0*
British South Africa	—	11 0*	—	—	—	—
Bushveld Tins	0 7*	0 7*	—	—	—	—
Cassel Coals	—	20 0*	20 0*	20 0*	20 3*	20 6*
Cinderella Cons.	6 9*	—	6 6*	7 0*	6 0*	6 0*
City and Suburbans	36 0*	36 0*	—	36 3*	35 9	—
City Deeps	80 0	81 0	81 6*	84 0	85 0*	84 6*
Cloverfield Mines	8 6*	8 6	8 3*	8 3	8 2	8 8
Clydesdale Collieries	9 6*	9 6*	9 6*	—	9 6*	9 6*
Concrete Construction	—	4 0*	4 0*	4 0*	1 0*	4 0*
Cons. Langlaagtes	28 0*	28 6*	28 3*	28 0*	28 0*	—
Cons. Main Reefs	18 0	17 9*	18 0	17 9*	17 9*	17 9
Cons. Mines Selection	20 9*	20 7*	20 6*	20 9	20 3*	20 9
Coronation Frecholds	—	—	—	0 4*	0 4*	—
Coronation Syndicates	—	—	—	1 6*	—	—
Crown Diamonds	2 0*	2 0*	2 0*	2 0*	2 7*	—
Crown Mines Debentures	—	£100+	—	£99+	—	—
East Rand Centrals	—	—	9 3*	8 9*	8 9*	8 9*
East Rand Debentures	£72½*	£72½*	£72½*	£72½*	£72½*	£72½*

*Buyers. +Sellers. A Odd lots. B Ex London.

	Fri., 25th.	Sat., 26th.	Mon., 28th.	Tues., 29th.	Wed., 30th.	Thurs., 31st.
East Rand Coals	3 1	3 2*	3 2*	3 2*	3 2	3 2*
East Rand Deeps	1 4	1 3	1 3*	1 4*	1 3*	1 4*
East Rand Mining Estates	17 6†	17 6†	16 3*	16 6	16 3*	—
East Rand Props.	14 0*	14 3*	14 3	13 9*	14 3*	14 6*
Eastern Gold Mines	1 7*	1 6*	1 7	1 6*	1 6*	1 6*
Frank Smith Diamonds	2 10	3 0	3 0	3 3*	3 9*	3 9
Geduld Props.	41 6	43 6	42 0*	42 0	42 0	42 3
Geldenhuis Deeps	—	—	—	—	—	27 6†
Glencairns	—	—	—	1 3*	—	—
Glencoe Collieries	—	—	6 9*	—	—	6 9*
Glynn's Lydenburgs	16 0*	—	16 0†	16 0†	16 0†	16 0†
Government Areas	44 9	44 9	44 9	46 9	45 9	46 0*
Jupiters	8 3*	8 3*	8 3*	8 6	8 3*	8 6
Klerksdorp Props.	—	—	—	—	2 4*	—
Knight Centrals	12 9*	12 6*	12 6	12 3*	12 0	12 0
Knights Deeps	21 0*	21 0*	—	21 0*	21 0*	—
Lace Props.	5 9*	5 10*	5 10*	6 0*	6 0	6 0*
Luipaardsvlei Estates	7 0*	7 3*	7 3*	—	—	—
Lydenburg Farms	8 0*	8 10	8 10	8 0*	8 3*	8 2*
Main Reef Wests	6 6*	6 6*	6 6	6 8†	6 3*	6 6†
Main Reef West Debs.	£62½*	£62½*	£55	£55	£52½*	£53½*
Meyer and Charltons	—	—	—	—	—	100 0*
Middelvel Estate	1 4*	1 4*	1 4*	1 8	1 4*	1 5*
Modderfontein B.	140 0	140 0†	136 0*	136 0*	135 0*	138 0*
Modder Deep Levels	135 0*	136 6*	137 0	139 0*	138 6	—
Leeuwpoot Tins	13 6*	14 0	13 9	13 6*	13 0*	13 6
Natal Navigation Colls.	16 6*	16 6*	—	16 6*	—	17 0*
National Banks	227 6*	—	—	227 6*	225 0*	227 6*
New Boksburgs	1 8*	1 8*	1 8*	1 8*	1 6*	1 8*
New Eland Diamonds	21 0†	21 0†	21 0†	—	—	—
New Era Cons.	9 6*	9 6	9 0*	9 9*	9 9*	10 0*
New Geduld Deeps	5 4*	5 6	—	5 6	5 5	5 4*
New Heriots	47 6	47 6	47 6*	47 6*	47 6*	47 6*
New Kleinfonteins	28 0	28 0	28 4†	29 6	29 0	29 3*
New Modderfonteins	362 6	360 0*	360 0	—	365 0†	365 0*
New Rietfonteins	0 6*	0 6*	—	0 6*	0 6*	1 0†
New Unifeds	10 6*	—	—	11 0	10 6*	—
Nigels	—	6 0*	—	6 0*	6 0*	6 0*
Nourse Mines	—	—	20 0*	18 0*	—	20 0†
Premier Preferreds	145 0†	—	—	145 0*	145 0†	145 0†
Pretoria Cements	79 0	—	79 6*	79 0*	80 0†	78 0*
Princess Estates	1 9*	1 9*	1 9*	1 9*	1 9*	1 9*
Rand Collieries	3 0*	3 0*	2 9*	2 9*	3 0*	—
Rand Klips	7 11 8	8 1*	8 1*	8 1*	8 3	8 9
Rand Nucleus	1 10*	1 11*	1 11*	1 10*	2 0*	2 1
Randfontein Deeps	3 8*	—	3 9*	3 3*	3 9*	3 9*
Randfontein Estates	13 0	13 0	—	13 0	—	12 9*
Roberts Victors	—	—	8 0*	—	—	10 0*
Rooiberg Minerals	11 0*	11 0*	11 0*	11 0*	11 0*	11 6†
Roodepoort United	10 6*	10 6*	10 0*	10 9*	10 9*	10 9*
Ryan Nigels	—	2 6*	2 6*	2 6*	—	2 6*
Schebas	2 6*	3 0*	2 3*	2 6*	—	2 0*
Simmer Deep	3 0†	2 6†	2 5	—	2 3*	2 3*
S.A. Breweries	31 0*	31 0*	31 0*	31 0*	31 0*	31 0*
S.A. Lands	5 1*	—	5 2*	5 2	5 3	5 4
Springs Mines	57 3	56 6	56 6	57 9	57 0	57 0
Sub Nigels	27 6	29 0	29 3	29 3	27 9	27 6
Swaziland Tins	—	—	30 0†	—	—	—
Transvaal Coal Trust	70 0*	71 6	70 6*	71 6	71 6*	—
Transvaal Lands	15 0*	16 0*	19 3*	19 0*	17 6*	17 6*
Transvaal G.M. Estates	21 0*	24 0	24 6*	24 6†	24 6†	24 6†
Van Ryn Deeps	67 6*	68 0	67 6*	68 0	67 3	67 0
Village Deeps	30 0*	—	30 0*	30 6*	30 0*	30 6*
Vogel Cons. Deeps	—	1 11	1 7*	1 9*	—	1 10*
Welgedahts	19 0*	—	19 0*	21 6*	23 0*	23 6*
Western Rand Estates	1 3*	—	—	1 3*	1 6†	1 3*
Witbank Collieries	41 0*	—	—	—	—	—
Witwatersrands	58 0†	56 0†	54 6	53 6*	56 0†	56 0†
Witwatersrand Deeps	23 0*	23 0†	23 9	23 6	23 6*	23 9*
Woluhuts	11 0*	11 6*	11 6*	11 8	11 3*	11 6*
Zaaiplaats Tins	7 6	6 0*	5 6	7 0	6 6*	6 9

*Buyers. +Sellers. A Odd lots. B Ex London.

CAM AND MOTOR DEVELOPMENT.—A cable has been sent by the Cam and Motor Gold Mining Company stating that in the seventh level of the Motor mine a crosscut has been put in at 148ft. north of winze (put down from the sixth level at a point 580ft. south of the main shaft) in a westerly direction, and has intersected 2ft. of ore showing free gold assay values £30 per ton, estimated value £20 per ton. (Office note.—This development is at a point 278ft. in a northerly direction from the values reported on 12th June last.)

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Altogether Improved Tone Through War Conditions—Electrical Goods from Japan—The American Trade—A Sharp Rise in Mercury.

THE outstanding subject for the moment is the new development of the war by Roumania joining the Allies. Naturally this news at once created a brighter and more optimistic feeling throughout commercial circles, perhaps more from a sentimental point of view rather than the trade outlook, at all events at the first flush. However, be that as it may, after things had quieted down, special enquiries were made and many influential merchants interviewed on the subject of the present and future outlook. To be quite candid, the opinions expressed as a rule were vague; nevertheless, in reviewing the information it appeared that the subject of trade had not taken any great hold upon the mercantile world at present. But in pressing the subject home it was admitted that a cloud of uncertainty had been lifted from the trade horizon which was a great relief for the future. Those merchants who ventured a tentative opinion said that although values would keep firm for a long while, they may ease off, particularly where material had abnormally risen, when there are further signs from time to time of the war conditions shaping towards peace. It is understood that the mines will continue their cautious plan of purchasing which was first noticed in June last and continued since. However, it was also gathered that nothing out of the ordinary will be bought, as the buyers are inclined to think that whilst values may not recede, they also think that prices will not advance under the present improved conditions. In the course of the interviews, the remark was often heard that now Roumania had joined it would shorten the war by six months. At the time of writing it is early to give anything like a true forecast of the future, but the forthcoming war events must have far reaching effects which cannot be gauged in these early stages.

IRON, STEEL, RAILS, AND HARDWARE.

Prices continue much the same for all kinds of iron and steel. All light section rails are scarce and have a tendency to advance, as the price for new is £23 per ton and second-hand £17½, as compared with £11 and £9 per ton respectively, before the war. All kinds of piping are also scarce, and values are constantly advancing, however consignments are expected to arrive at the coast shortly. Battery spares, particularly shoes, are in keen demand; a small parcel of second-hand was secured at 37s. 6d. per 100 lbs., and more wanted at the price. Other battery sundries, such as tappets, feeders, sockets, and heads, are much in request from the smaller Transvaal mines, and discretionary orders are on hand from Rhodesia. The Natal coal fields also are drawing quantities of mine sundries for their central market. One merchant on Thursday was very enthusiastic over Johannesburg not only retaining its present great distributing powers but will even expand them, as our converging network of railways lend themselves for that purpose. And now the roads throughout the mining Witwatersrand area are very decent for motor traffic, the travellers can visit all parts every week, and more often, when necessary with almost the same facilities as visiting a Johannesburg suburb. This is also supplemented by the merchants directing supplies on arrival at the coast, to outside places, and so obviating handling in Johannesburg.

THE TIMBER POSITION.

It is early days after the good war news to dilate on the timber position. However, what has been gathered is worth the telling. The idea prevails that timber will remain much at these levels until something more happens in Europe. In the meanwhile contractors will go on buying just enough to supply their immediate needs, but no big forward contracts are likely to be entered into either by the

mines or builders. However, there is anything but unanimity on the whole subject, but as the freight on timber has advanced 120 per cent. on pre-war rates, that leaves plenty of margin for a decent drop, as the accumulation of stocks in the Baltic during the war must be on the huge side, therefore the great factor is still the freight question, upon which at the moment of writing hardly two responsible people are in accord as to the future—that is, during the present year.

ELECTRICAL GOODS FROM JAPAN.

The second consignment of electrical goods has just come to hand from Japan. As a preliminary they are excellent, particularly when the price is considered at the place of origin. It is understood that direct shipments have not been arranged yet, but this is only a matter of time. The present consignment came via London. The ceiling roses were examined and compared with others, and the new arrivals from Japan are in every way equal, also similar remarks apply to the lamp holder cord grips. The outstanding feature is in the Japanese porcelain, which is of a darker hue than the British, but as explained by the expert in electrical matters, the first named does not partly absorb water, whereas the European kinds do. Further, the importer remarked that according to the factory price, which could not be disclosed at present, the Japanese will easily compete with the cheap pre-war supplies from the Central European countries, to say nothing of the British goods. During the past few days enquiries have been more plentiful and business looks promising.

THE AMERICAN TRADE.

So far there is very little new to record. The same old difficulty of railway transport to New York and the scarcity of shipping from there still present themselves. A representative remarked: "We Americans need not worry ourselves for the next few months. However," he continued, "it is just as well for you to remind your readers that whatever happens about trade restrictions in Europe, we shall have a free field with all Europe, which will mean a lot of business." The matter of the sudden drop in wheat on the Liverpool market was mentioned, as a prelude to a drop in mineral oils and motor spirits when Russian and Roumanian supplies were released. The reply came that there was plenty of time to think about all that, as motor spirit would be in ever increasing demand for a very long while even after the war.

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A SHARP RISE IN MERCURY.

A wholesale house wanted, this week, a few bottles of mercury to complete an up-country order, and rather to their surprise, they had to pay £21 10s. instead of £18 15s., the supposed ruling price locally. The fact is that the mines are out of the Johannesburg market because they arranged their forward contracts on the outbreak of the war. The manager who gave the information stated that mercury had gone up in London, because the British Government are in the market, for their munition factories, where quantities of mercury are used.

THE OIL AND COLOUR TRADE.

The Johannesburg prices have not ostensibly altered, but the coast people, more particularly Durban, are on the selling tack. So much so that lines have been offered in Johannesburg under what they can now be landed at from oversea. Whether it is because the Durban season is waning, or whether it is because people thought that London could not ship, or both combined perhaps, it is difficult to say. Hence there is an easier tendency, as holders here are freely meeting buyers for spot transactions. About a fortnight ago men for jobbing and other painting work were difficult to get, but now there are more seeking work, because a lot of jobs had to be finished in readiness for occupation by September 1st. However, there is a more optimistic spirit abroad that work will soon come along, owing to the war conditions and the near approach of summer. By the way, there has been a further rise of 3d. per gallon in all engine and lubricating oils.

COMMERCIAL EXCHANGE.

The annual meeting showed that the membership had increased to 210 members. The report was quite on the optimistic side, perhaps a little too much so, which nevertheless is a good fault. The member tendering this criticism said that it depended much upon what you were dealing in and how much you had in stock. As against this, of late no doubt the more speculative holders have been under the financial necessity of sacrificing, owing to ordering too much and, what is more, getting it.

REVISED PRICE LIST.

Approximate war prices, subject to quick change.—Mining and building hardware: Iron, imported, round up to 1 in., 30s.; 2 in. to 6 in., 25s. per 100 lbs. Ditto, square, up to 1 in., 27s. 6d.; 1½ in. to 2½ in., 13s. 6d.; 2½ in. to 5 in., 25s. Flats, 3-16 in., 37s. 6d.; all from ¼ in. up, 30s. Angles, ½ in. to 3-16 in., 30s.; ¼ in., 27s. 6d.; 5-16 in. to ¾ in., 25s., excepting 5 x 4 x ½ in.; mild steel bar, 4½d. lb.; drill, 7lb.; steel plates, 10ft. by 4ft. by 1-16th in., 35s.; ½ in., by 3-16in., 32s. 6d.; ¼ in. to 5-16th in., 31s.; ¾ in., up to 30s.; 10ft. by 5ft. by 1-16in., 36s. 6d.; ¾ in. and 3-16in. 34s.; ½ in. to 5-16in., 32s. 6d.; ¾ in., up to 31s. 6d.; intermediate sizes up to 12ft. by 6ft. by 1-16in., 37s.; ¾ in. and 3-16in., 34s. 6d.; ¼ in. and 5-16in., 33s.; ¾ in. and up 32s., all at per 100lb.; hexagon and cuphead bolts, ½ in. diameter to 2½ in., 55s., over 2½ in., 52s. 6d., ¾ in. to 2½ in., 50s., over 47s. 6d., ¾ in., ¾ in., 1 in., up to 2½ in., 45s., over, 42s. 6d.; nuts, ¾ in., 10d. lb., ¾ in., 60s., ¾ in., 57s. 6d., 1½ in., 1½ in., 62s. 6d., 2 in., up, 67s. 6d.; washers, all sizes, 45s.; rivets, 3-16in., 1s. 1d. lb., ¼ in., 5-16in., 10½d., 7-16in., ¾ in., 7½d., ½ in., 45s., ¾ in., 42s. 6d., ¾ in. up, 40s. lb.; shoes and dies, 32s. 6d. to 35s. per 100lb.; rails, £23 per ton; picks, 4lbs., 27s. per doz.; shovels, 32s. 6d. to 50s. per dozen; hammers, drills, 6½lb. to 9d. lb.; hammer handles (best American), 14 in., 3s. 6d., 24 in., 5s. 6d., 30 in., 7s. 6d., 36 in., 10s. 6d. per doz.; metal, anti-friction, 1s. per lb.; galvanised iron, 24 gauge, 6 ft. to 10 ft., 10½d., 11 ft. 10½d., 12 ft. 11½d.; 26 gauge, 6 ft. to 10 ft., all lengths, 8½d. to 9½d. per ft. all-round; flat galv., 18 to 24 gauge, 32s. 6d.; 26 gauge, 34s. 6d. 100 lbs.; floor brads, 32s. 6d.; ceiling, 33s.; wire nails, 35s. to 40s. per 100lb.; solder, 50 per cent., 1s. 2d. per lb.; locks, rim, 48s.; mortice, 60s. dozen; barbed wire, 22s. 6d. to 25s. 100lb. coil.

Timber: Deals, Baltic, 9 x 3, short and medium 1s. 1d.; longer lengths, 1s. 2d. to 1s. 3d. (Oregon, 1s. 1½d.); flooring, 4½ x ¾ and 6 x ¾, 6½d. to 6¾d. per sq. ft.; do., 4½ x 1½, 7d.; and 6 x 1½, 7d.; Oregon edge grain, 4 x 1½, 7d.; ceilings, 6 x ½, 3½d. to 3¾d. per

sq. ft.; Oregon, 4 x ½, 4½d.; pitch pine, 8s. per cub. ft.; Oregon, 6s. per cub. ft.; clear pine, ½ in. x 12 in., 7½d. per ft.; 1 in. x 12 in., 8½d.; teak, small planks, 14s. 9d. per cub. ft.; do., large, 15s. 6d.; jarrah, 8s. 6d. per cub. ft.; poplar, 1 in. x 12 in., 9½d.; scantling, 1s. 1d. to 1s. 3d. per ft., 3 x 9.

Bricks, cement, lime, etc.: Cement, nominal, 34s. 6d. per cask; Pretoria Portland, 9s. 3d. per bag; 8s. 3d., truck loads; lime, white, 7s. 9d.; truck loads, 6s. 9d., slaked; do., 5s.; blue, 3s. 6d.; plaster lime, 4s.; bricks at kiln, stock, 36s. to 42s.; wire cuts, 40s. to 50s. pressed, 65s. per 1,000, road transport getting scarce; salt and white glazed bricks, £27 10s per 1,000; tiles, roofing, £17½ square; glazed tiles, 10s. 6d. to 17s. 6d. yard; paving cement tiles, 8s. 6d. yard laid; terra cotta tiles, £15 per 1,000; reinforced concrete columns, 6 ft. plain, 22s. 6d., fluted, 24s.; fireclay bricks, £9½, good average, per 1,000; clay chimney pots, 80s. per doz.; fireclay, 37s. 6d. ton on rail.

Oils, paints, lead, oxides, glass: Linseed, raw, 27s. 6d.; boiled, 27s. 6d. per 5-gall.; white lead, 70s. to 72s. 6d. 100 lbs.; turpentine, 49s. 2/4 galls.; 10/1, 54s.; coal tar, imported, 10s. to 12s. 6d. per 5 galls.; oxide in oil, 35s. to 36s. per 100 lbs.; dry oxide, 21s. to 22s. 6d.; S.A. crude oxide, 12s. 6d.; linseed oil putty, 4s. 6d. per 12½ lbs.; bladders, 35s. casks of 100lbs.; grease A.F. axle, 23s. 6d. to 25s. per 100 lbs.; tallow, 1s. per lb.; White Rose paraffin, 17s. 3d. 2/5; Laurel do., 17s.; petrol, 27s. 6d. 2/4; motor oil, 6s. to 7s. 9d. per gallon; engine lubricating oils, 22s. to 35s. per case; cylinder, 25s. to 40s.; paints in tins, 10d. to 1s. per lb., according to quantity, and if ordered to be mixed, 20 per cent. on pre-war rates. British plate-glass, ¼ in., 3s. 6d.; do., mirror, 4s. 6d.; window, 16oz., 1s. to 1s. 3d. foot.

Chemicals: Mercury, £21 per 75 lb. bottle; bichromate potash, 2s. 6d. lb.; chlorate, 2s. 6d. lb.; permanganate, 9s. lb.; alum, 5d. lb.; carbolic acid, 7s. 9d. lb.; borax, 85s. 100 lbs.; cyanide soda, 1s. 5d. lb.; hypo, 9d. lb.; acetate lead, 70s. 100 lbs.; litharge (assay), 70s. (commercial), 55s. 100 lbs.; zinc sheets and blocks, 1s. 6d. lb.; plumbago crucibles, 5d. per number.

Electrical Goods: Lamps, high volts., British, Holland & American, 16s. to 21s. wholesale, and 21s. to 27s. dozen, retail; carbon lamps, 7s. 6d. per dozen; pure rubber flex, 5d. to 6d. per yard; 3/20 coils of wire, 26s.; do., 3/22, 22s. 6d.; tubing, 12s. to 13s. 100 ft.; keyholders, 3s. each; round blocks, 3½ in., 3s. 6d. doz.; lamp holder cord grips, 13s. 6d. doz.; switches, 5 amp., 13s. to 14s. doz.; British glass shades, 24s. to 36s. doz.; Bohemian shades finished; porcelain shackles, 14s. 6d. doz.; do., bobbins, 9s. to 9s. 6d. per 100; cleats, 18s. per 100; P.O. insulators, 18s.; motors, 3 h.p., about £28 to £35, new.

ANSWERS TO CORRESPONDENTS.

All inquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to inquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

"N.K."—The plant is running very smoothly; and there should be a very healthy profit for September. A profit of 8s. per ton would give 30 per cent. per annum on an estimated life of 37 years.

"M.A." (Selukwe).—The notes on tale, printed in another part of this issue, answer your questions.

"Anxious."—Without foundation.

"V." (Port Elizabeth).—Reply duly wired.

"Shareholder."—An announcement regarding the increase in the plant may be expected at any moment.

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Expert Winders of Motors, Dynamos and Coils of every description. Makers of all classes of spare parts. Turning. Electrical Plants. Installed. Maintenance Contracts entered into, covering cost of all breakdowns, at low rates.

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JOHANNESBURG.

Box 1642.

Rhodesian Section.

RHODESIAN MINERAL OUTPUT.

Details for July.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of July, with comparisons and values:—

MATABELELAND.

BULAWAYO DISTRICT—

	No. of stamps. treated.	Tons	Yield. ozs.	Value. £
Abercorn 3 (W. J. Lane)	5	56	58.15	241
Abercorn 4 (W. J. Lane)	(5)	204	33.00	137
Agincourt (Hogg & Co.)	5	225	120.16	498
Anasona (Rhodesia, Ltd.)	3 1P	360	713.24	2,957
Antelope G.M. (Rhod.), Ltd.	2B 2P 1T	4,104	893.60	3,704
Do. (slimes)	—	3,775	1,007.55	4,177
Bassick (Bassick Mine Syndicate)	5	100	64.14	266
Black Prince	2	45	11.59	48
Bulawayo Main (Aserman and Cormack)	5	300	80.15	332
Do. (sands)	—	144	15.51	64
Bushy Park (Berwitz & Robinson)	—	200	30.87	128
Do. (sands)	—	—	36.37	151
Do. (clean-up)	—	—	132.01	547
Camp	5	695	46.29	192
Do. (sands)	—	440	74.78	310
Carry (Boomerang Syndicate)	1 H	111	50.83	211
Cart Wheel (J. Cook)	3	45	42.37	176
Cecil (Master Cecil Syndicate)	3	60	82.29	341
Claydon (Ettie Syndicate)	3	378	20.21	84
Do. (sands)	—	216	38.99	162
Confidence (A. D. Hall)	5	85	38.28	159
Coquette (W. H. Robinson)	2	182	18.00	75
Czar (A. R. Jacoby)	1 H	30	82.07	340
Donove A. (W. K. Early)	2	42	23.82	99
Do. (sands)	—	100	60.09	249
Doris	4	326	222.20	921
Durban (Durban Syndicate)	2	230	127.94	530
Do. (sands)	—	120	172.13	713
Eagle A. (Macdonald & Co.)	10	823	34.69	144
Do. (sands)	—	420	134.28	557
Elizabeth (Elizabeth Mining Synd.)	10	59	468	—
Do. (slimes)	—	468	86.46	358
Elumba A. (E. W. Bosomworth)	5	300	38.97	162
Do. (sands)	—	250	13.17	55
Excelsie (Excelsie Syndicate)	2	10	483.36	2,050
Farvie (H. S. Henderson)	5	750	41.72	177
Do. (sands)	—	724	93.42	387
Flora (J. L. Henderson)	2	250	1,249.86	5,181
Fred (Transvaal & Rhodesia Est.)	10 2P	1,950	1,249.86	5,181
Do. (sands)	—	1,950	181.11	751
Geelong (Hogg & Co.)	10	1,250	256.55	1,064
Germania (W. Haddingham)	2	192	123.48	512
Godwin B. (F. C. Barrett)	5	250	185.48	769
Great Belingwe (R. C. Boyes)	5	760	58.10	241
Hildata A. (R. Aserman)	5	711	18.40	76
Do. (sands)	—	192	19.52	81
Imalini (C. Conrath)	1 H	40	2.53	10
Do. (sands)	—	40	90.90	377
Intabanenda (Intabanenda Synd.)	5	340	37.97	157
Do. (sands)	—	525	131.49	545
Iron Duke (Iron Duke Synd.)	3	165	125.32	519
Jeffs (Horton & Stewart)	3	264	216.16	896
Jessie (Harrill & Smith)	10	1,000	73.72	306
Jumbo (A. D. Hall)	5	327	219.23	909
Jumpers (J. P. McCay)	5	450	37.89	157
Do. (sands)	—	240	59.40	246
Long Hand (Armstrong, Furber and Alexander)	5	360	52.57	218
Do. (sands)	—	230	862.28	3,575
Lonely Reef G.M. Co., Ltd.	20 3T	5,110	2,352.61	9,753
Do. (slimes)	—	5,110	660.61	2,739
Long John (Susanna Mines, Ltd.)	2 GR	4,223	154.33	640
Maamba (Nicholls & Co.)	5	360	10.88	45
Do. (sands)	—	110	381.43	1,581
Matabele Queens Co., Ltd.	10	2,020	298.23	1,236
Do. (sands)	—	2,020	22.08	92
Mayfair (Hicks & Arbery), sands	—	550	10.16	42
Merrythought (Merrythought Synd)	3	14	16.59	69
Mission (Emerton & Matthews)	1 H	45	11.38	47
Mulloch	2	18	—	—

	No. of stamps. treated.	Tons	Yield. ozs.	Value. £
Near By (R. Innes)	1 D	8	7.54	31
Nelly (F. D. Roscoe)	2 H	883	249.79	1,035
Do. (sands)	—	360	104.91	435
Do. (slags)	—	—	38.57	154
New Eclipse (J. R. Stewart)	5 1T	1,200	158.38	657
Nicholson (clean-up)	—	—	27.56	114
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	2,631	556.55	2,307
Do. (sands)	—	1,575	153.07	635
Peach A. (Peach Syndicate)	5	416	341.13	1,414
Do. (sands)	—	206	44.45	184
Princess (C. A. Abbott)	2	50	14.85	61
Prince Olaf (K. Johnsen)	5	276	267.12	1,107
Queens West (Cumings & Berry)	5	600	229.05	950
Rhodesian Queen	5	45	26.97	111
Sabi (Durrett & Gardiner), sands	—	1,000	74.61	309
Sachsen (Netta & Sturm)	5	7	3.49	14
Seafield (Arbery & Hicks), June	5	750	115.51	478
Do., July	—	750	146.41	607
Slope 1 (E. E. Beeroff)	5	849	86.48	358
Southern Cross (E. Basch)	5	200	42.00	174
Star (Romola Nigel G.M. Co.)	5	400	110.70	459
Do. (sands)	—	237	38.88	161
Teutonic (W. & A. Syndicate)	5	650	103.49	429
Tor (R. J. Howe)	2	300	54.69	227
Wolley Dog (P. H. Davis)	5	418	241.49	1,001
Do. (sands)	—	204	46.33	192

Bulawayo district total

16,820.70 69,773

GWELO DISTRICT—

Alderman (Williams & Woodger)	5	295	75.46	313
Allanah (T. A. Taylor), sands	—	380	12.82	53
Anniversary (Mrs. Dollar)	2	57	38.70	160
Bell Reef Dev. Co., Ltd.	2B 1T	3,392	1,325.10	5,493
Do. (slags)	—	—	62.80	251
Bonsor B323 (Cornish Syndicate)	10	640	117.75	448
Do. (sands)	—	375	14.74	61
Bonsor B327 (T. Roberts)	10	775	104.32	432
Cactus (Renton & Gray)	5	400	69.59	288
Do. (sands)	—	380	47.17	196
Cap (W. Cock)	2	30	9.60	40
Csardas (Wolshall Syndicate)	10	567	559.98	2,238
Do. (sands)	—	420	70.88	294
Do. (slimes)	—	147	18.81	78
Dixie (Dixie Syndicate)	2	100	23.27	96
Emerald (Boston & Flame)	5	650	151.65	629
Do. (sands)	—	210	21.41	89
Falcon Mines, Ltd.	36 3T	19,982	2,994.22	13,518
Do. Copper, £15,628.	—	—	—	—
Fed Up (A. Malcolm)	5	278	122.72	509
Gaika G.M. Co., Ltd.	5 1C	2,746	1,351.09	5,675
Do. (slimes)	—	3,757	235.76	990
Glen Hume (Hume, Withey and Walker)	10	1,201	122.07	506
Glen Rosa (Glen Rosa Syndicate)	10	667	107.72	446
Do. (sands)	—	710	91.59	380
Globe and Phoenix G.M. Co., Ltd.	40 10P	6,380	5,777.82	24,267
Do. (sands)	—	8,203	1,391.82	5,846
Do. (slimes)	—	2,232	346.97	1,457
Do. (concentrates)	—	300	477.36	2,005
Homestake (A. Skeen)	2	50	17.03	71
Ingersoll (C. T. Uren)	2	28	13.53	56
Ingondomo (F. C. Luxat)	1 H	730	143.98	597
Do. (sands)	—	400	60.95	253
Leopard	5	500	74.19	308
Loyalist (B. Bertoldi)	3	91	52.71	211
Lulu (C. W. Leppington)	2	72	33.17	131
Moss (W. M. James)	5	981	498.50	2,029
New Dunraven G.M. Co., Ltd.	5	601	129.89	538
Do. (sands)	—	357	31.12	129
Pagamesa (W. H. Peard)	15	715	171.80	712
Do. (sands)	—	715	86.30	358
Pondo (F. C. Luxat)	5 1H	1,000	181.58	753
Do. (sands)	—	528	34.98	145
Record (Pini & Wearing)	5	360	29.68	123
Renvyle (A. & B. Syndicate)	5	575	65.84	273

	No. of stamps.	Tons treated.	Yield. ozs.	Value £
Selukwe-Columbia G.M., Ltd.—				
Danga	10 1P	430	122.42	507
Do. (sands)	—	209	42.70	177
Wonderland	—	1,073	343.96	1,426
Do. (sands)	—	588	119.97	497
Yankee Doodle	10	1,125	136.84	567
Do. (sands)	—	345	68.63	285
Shamrock (H. H. Crampin), sands	—	500	27.78	115
Stranger (J. M. Havnar)	2	332	30.49	126
Tabekwe I. (A. N. Tyrrell)	15	460	94.86	393
Trixie (S. Levin)	10	1,348	335.43	1,390
Do. (sands)	—	1,240	52.75	219
Umpali (Bolt & Reed)	5	285	71.44	296
Do. (sands)	—	450	19.40	80
Veracity (L. R. Evans)	—	420	134.19	556
Do. (sands)	—	792	47.62	197
Walrus (J. Jones)	—	170	49.38	205
Do. (sands)	—	600	44.08	183
Wanderer (Selukwe) G.M., Ltd.	4 GR	13,300	1,330.51	5,516
Zabonkwe (Holmes & Urquhart), sands	—	920	142.25	590
Gwelo district total			20,554.24	86,824

MASHONALAND.

HARTLEY DISTRICT—				
Acorn (Anzac Syndicate)	5	680	199.74	828
Do. (sands)	—	450	64.13	266
Arlandzer (Keir & Rooke)	10	1,440	75.49	313
Do. (sands)	—	1,440	224.17	929
Baltimore & Virginia (P. A. Enke)	5	180	27.12	112
Blue Bird (Cuba Syndicate)	5	200	23.60	98
Brilliant (Mabel's Luck Syndicate), slimes	—	1,038	160.29	664
Brompton (R. R. Aitken)	5	790	332.40	1,378
Do. (sands)	—	650	102.01	423
Buffalo (E. A. Begbie)	5	570	127.50	529
Cam and Motor G.M. Co., Ltd.	—	14,402	3,883.85	16,465
Campania (G. C. Hooper)	3	576	44.49	184
Do. (sands and slimes)	—	142	58.51	243
Concession (C. E. Simpson)	5 1C	634	111.43	462
Do. (sands)	—	634	50.90	211
Concession W. Ext. (C. E. Simpson)	—	647	159.98	663
Dalny (Macdonald & Sale)	1 C	2,006	80.05	332
Do. (sands)	—	2,000	124.26	515
Dalny 1 W. (Macdonald & Sale)	5	500	106.58	442
Do. (sands)	—	300	93.47	408
Dawn (Arrow Syndicate)	5	680	142.21	589
Do. (sands)	—	378	29.02	120
Dreadnought (W. E. Masters)	5	479	45.39	188
Eiffel Blue (Willoughby's Cons. Co.)	10	1,496	793.66	3,290
Do. (sands)	—	1,010	53.22	221
Eileen Alannah Mining Co., Ltd.	12 2T	5,000	513.25	2,128
Do. (sands)	—	5,265	1,223.19	5,071
Enney Ext. (E. G. Goodyer)	5	725	217.70	902
Do. (sands)	—	1,400	72.15	299
For Cash Only (Cuba Syndicate)	5	100	10.30	43
Glasgow Mines, Ltd.	5	562	127.03	527
Do. (sands)	—	300	39.00	162
Giant Mines of Rhodesia, Ltd.	30	7,000	954.75	4,049
Glencairn (Pickstone G.M., Ltd.)	5	694	417.69	1,732
Do. (sands)	—	950	80.76	335
Golden Valley (J. Mack)	10	1,116	533.38	2,211
Do. (sands)	—	612	93.47	387
Guelph (J. & M. Davidson)	3	133	29.78	124
Heroine (Rolley & Rollston)	1 11	380	33.60	139
Inkerman (I. J. Minnaar)	5	310	204.52	848
Do. (sands)	—	260	91.42	379
Inez (H. C. Fitzgerald)	10	300	48.66	202
Just in Time (C. Somerset)	2	484	139.14	577
Kanyemba (Banner & Bircumshaw)	10	290	341.53	1,416
Do. (sands)	—	240	32.07	133
Mid Lothian (A. F. Johnston)	2	100	74.45	309
Mudale (E. A. McDowell)	5	500	82.12	340
Oleander (O. T. de Villiers)	—	200	19.53	81
Orchid	—	455	101.32	420
Owl (A. Rolfe)	10	1,649	1,623.93	6,732
Do. (sands)	—	1,560	374.36	1,552
Owl Extension (Cribb & Secar)	5	804	223.38	926
Do. (sands and slimes)	—	798	60.52	251
Pomposo (J. Knott)	2 11P	120	28.56	118
Seigneury (Seigneury Synd.)	10	1,004	160.62	666
Do. (sands)	—	950	38.12	158
Shepherds (Phoenician (R.) Co.)	5 1T	900	156.27	648
Do. (sands)	—	900	55.04	228
Thistle-Etna G.M., Ltd.	1 C	1,120	295.93	1,229
Do. (sands)	—	445	52.66	219
Venice (sands and slimes)	—	900	112.03	464
What Cheer (H. Moser)	5	408	260.75	1,081
Do. (sands)	—	350	66.45	275
White Rose (White Rose Synd.)	2	210	78.23	334
Hartley district total			16,185.63	67,556

LOMAGUNDI DISTRICT—

	No. of stamps.	Tons treated.	Yield. ozs.	Value. £
Alluvial	—	—	133.72	555
Angwa B. (F. L. Standen)	5	840	103.95	431
Crescent	—	150	13.06	52
Devonia (F. K. Brown)	2	136	19.49	81
Eldorado Banket G.M. Co., Ltd.	20 1C 4P	4,242	1,473.16	6,187
Do. (sands)	—	4,237	992.40	4,168
Golden Kopje Prop. Mines, Ltd.	60 3T	12,048	616.20	2,588
Do. (slimes)	—	12,048	1,664.81	6,992
May (May Syndicate, Ltd.)	5	300	33.73	140
Do. (sands)	—	160	17.86	74
N.G.F. Main W. (E. A. Schley)	2	120	28.09	116
Lomagundi district total			5,096.47	21,384

MAZOE DISTRICT—

	No. of stamps.	Tons treated.	Yield. ozs.	Value. £
Ancient & Modern (L. Southey) ..	2	50	13.63	56
Botha H. (Clarkson & Sons)	2	1,050	33.14	137
Do. (sands)	—	800	80.74	335
Chin (Arrow Syndicate, Ltd.)	5 1P	928	60.81	252
Do. (sands)	—	436	95.34	395
Do. (slimes)	—	492	87.00	361
Jumbo G.M. Co., Ltd.	5	560	208.72	865
Kimberley (Mash.) G.M. Co., Ltd.	8 2T	5,000	1,060.30	4,497
Do. (sands)	—	5,000	385.65	1,626
Kingsley Hoard (A. S. Warwick) ..	—	673	50.76	210
London (Shashi)	2	87	7.64	32
Micky (Micky Syndicate)	2	357	79.74	331
Moffat (Laing & Marshall)	2	84	24.10	100
Promoter (F. C. Croxford)	1 C	2,208	71.35	296
Do. (sands)	—	1,925	80.81	335
Rosa (B. G. Byerley)	2	221	69.26	287
S.D.C.I.N. (H. S. Plant)	2 H	1,700	65.74	272
Xmas (A. Chiappini), sands	—	300	32.52	135
Other Sources	—	—	1.44	6
Mazoe district total			2,508.69	10,527

SALISBURY DISTRICT—

	No. of stamps.	Tons treated.	Yield. ozs.	Value. £
Alpes (P. Zaffere)	5	246	507.28	2,103
Do. (sands)	—	216	26.45	110
Arwee (Johnson & Fynn)	3	30	9.45	39
Cross-your-Luck (W. A. Hoole)	—	2,210	86.00	356
Do. (sands and slimes)	—	112	30.65	127
Gingham (W. Odgers)	3	20	3.43	14
Joking (Harrison & Drabble)	2	281	363.09	1,505
Do. (sands)	—	266	133.72	550
Do. (concentrates)	—	—	16.51	96
Mashona (H. S. Plant)	2	230	45.42	188
Mont d'Or (Claxton & Bussell) ..	5	311	197.57	819
Olympus C. (Harris & Cunningham) ..	5	630	184.07	763
Do. (sands)	—	324	48.09	199
Planet (Planet Tribute Synd.)	10 2P	948	246.14	1,020
Do. (slimes)	—	948	282.50	1,171
Radnor I. (London and Rhodesia M. & L. Co.)	5 2P	1,295	357.58	1,482
Shamva Mines, Ltd.	56 8T	49,057	2,431.19	10,211
Do. (sands)	—	26,611	6,707.65	28,172
Do. (slimes)	—	22,410	—	—
Southern Cross (H. G. Bateman) ..	2	206	29.40	122
Trio (Trio Syndicate)	5	510	154.79	642
Other Sources	—	—	1.31	5
Salisbury district total			11,862.29	49,668

UMTALI DISTRICT—

	No. of stamps.	Tons treated.	Yield. ozs.	Value. £
Bessie and Gem (J. Buchanan)	5	900	54.33	224
Do. (sands)	—	900	142.33	590
Constance A. (J. F. Kapnek)	5	1,089	129.12	535
Golden Gate (Meikle & Davis) sands ..	—	2,900	134.42	557
Golden Frog (W. A. Hoole)	5	150	9.58	40
Inca (R. M. Evans), sands	—	650	25.07	104
Kent Mines, Ltd.	10	1,309	276.62	1,147
Do. (sands)	—	880	42.74	177
Liverpool 38 (R. G. Snodgrass)	5	700	87.76	364
Do. (sands)	—	270	17.13	71
Phoenician	5	144	23.12	96
Rainbow (Rainbow Syndicate)	5	150	22.73	94
Rezende Mines, Ltd.	70	10,400	877.75	3,724
Do. (sands)	—	3,593	315.38	1,338
Do. (slimes)	—	1,492	104.17	442
Do. (concentrates)	—	128	436.46	1,852
Sheepskin (Roberts & Peile)	5	336	25.90	107
Toronto (J. H. Jeffreys)	5	1,000	145.93	605
Do. (sands and slimes)	—	440	174.45	723
Virginia (F. Young), sands	—	420	66.55	276
Wyrallah	5	100	11.64	48
Umtali district total			3,123.24	13,115

VICTORIA DISTRICT—				
Empress (S.A. Pros. & Co. Synd.)	8	1,490	185·90	771
Do. (sands and slimes)	—	1,490	180·55	748
Texas (P. S. Warden)	10	1,200	395·95	1,641
Do. (sands)	—	255	33·52	139
Wake Up John (S. Hemlock)	2	120	52·61	218
Victoria district total			848·53	3,517

ASBESTOS.			
	Tons.		Value.
Bulawayo District—			
Birthday A. (N. Moore)	55·10		£882
Birthday C. (Mrs. Longhurst)	10		160
Nil Desperandum (E. Machell)	14·5		232
Gwelo District—			
Mopani (Aronson & Readman)	12		192
Victoria District—			
Balmain (P. T. Hoad)	14		224
Clansman (A. Aronson)	3		48
Hannah (Hendry & Martin)	16·6		171
King Asbestos (Rhodesia), Ltd.	232·45		3,719
Regina (P. A. Nightingale)	26·77		428
Victoria (Rhodesia) Asbestos, Ltd.	59·36		950
Victoria (Rhodesia) Asbestos, Ltd.	8·36		50
	452·14		£7,056

SUMMARY.			
			Value.
Gold, ounces	76,999·79		£322,365
Silver, ounces	18,446·07		2,372
Copper, tons	346·62		17,692
Coal, tons	43,403·00		11,074
Chrome iron, tons	8,756·33		39,091
Asbestos, tons	452·14		7,056
Diamonds, carats	94·25		574
Grand total value			£400,224

COMPARISONS.		
Gold output—	Ounces.	Value.
June, 1916	79,518·33	£333,070
July, 1916	76,999·79	322,365
Decrease	2,518·54	£10,705

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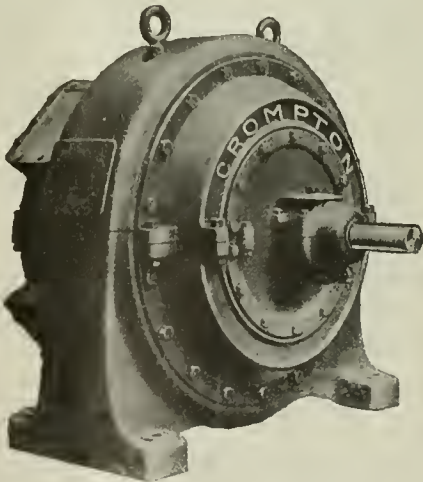
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Company Meetings.

VRYHEID (NATAL) RAILWAY COAL AND IRON.

The eighth annual general meeting of the members of the Vryheid (Natal) Railway Coal and Iron Company, Ltd., was held on July 28th at Winchester House, Old Broad Street, E.C., Mr. J. C. Hamilton Greig (the chairman) presiding.

The Chairman said: Gentlemen,—In presenting to you our eighth annual report for the period ended January last, you will see that the result shows a further slight improvement on previous returns, the profit for the year being £13,853 8s. 3d., which, added to the amount of £10,597 17s. 5d. brought in, leaves £24,451 5s. 8d. to the credit of profit and loss account.

DEVELOPMENT SCHEME.

As you know, we have a long lease of the mineral rights of the Mountain Hlobane, where our present colliery is situated, and we also own the freehold mineral rights of another large coal property, Clifdale, almost adjoining. Up to the present we have only opened the one mine on the mountain, but with additional capital we could open a new working on the eastern side of the mountain, and another at Clifdale, thereby trebling our present output. With the view of raising enough fresh capital to carry out the development of these coal areas now lying dormant, and at the same time putting our share capital on a more satisfactory basis, we have carefully studied various schemes of reconstruction, but up to the present have not adopted any scheme which we could put before you as being absolutely fair to each interest, and which we might expect would receive the approval of the Treasury, as without their sanction no fresh issue can be made. We have not, however, abandoned all idea, and hope that at a favourable opportunity we may yet provide some method, when we should at once submit the same to you; but when you realise the many difficult points which I have already outlined, and bearing in mind that unless we can secure your unanimous approval no scheme could possibly be successful, I am sure you will appreciate the difficulties of the problem.

INCREASED OUTPUT.

As regards the business of the company, I am able to report that in every direction it is perfectly sound, the only point being that competition is still so keen that it has been entirely beyond our power to command a fair and reasonable profit for our coal. The output has been, and is still, going up most satisfactorily. Last year our output was 50,400 tons in excess of the previous year, and last month (June) we reached our record of 36,020 tons, which we anticipate will be still further improved upon. (Hear, hear.) For the first five months of the current year our output has reached 163,400 tons, against 124,592 tons in the corresponding period of 1915, an increase of 38,808 tons. The coal still maintains its character, and we have no difficulties in this direction. For the current year we have sold our entire output at prices which are an improvement on last year, but our future success depends upon our still further increasing our output, and I only wish we were working and producing coal from the two other mines on our own property, to which I have already

referred, especially as we are now approaching the maximum quantity our present plant is capable of dealing with. As you know, the South African Government have the option of calling upon us for a certain quantity at 5s. per ton at the pit. Not only do they take this, but we have recently renewed the contract for a period of years for a large additional quantity at a higher price. As our output increases, so does our revenue from our railway, and on the present output that brings in enough to pay the interest on the whole of the Debentures. Last year I explained to you our necessity for having raised a loan, but you will notice we have now paid off the whole of this, partly out of the balance of the authorised issue of Debentures and partly out of profits, so that this saving in interest charges will assist us in regard to our returns for the future.

DIFFICULTIES BEING OVERCOME.

The whole of our past troubles have been brought about by difficulties which it was quite impossible for us to overcome in the early days of the company. First, lack of labour, lack of wagons, and even during the past year we might have been able to show better results but for the fact that the Government found it necessary to prohibit the export of South African coal, and this kept prices down to a lower level than would otherwise have been the case. For almost the first time in our history we have all the native labour we require for our present workings, and we are advised that we ought to experience no difficulty now in keeping to this level by replacing time-expired men. I am firmly convinced that we shall overcome all our difficulties, as the business itself is now well established and perfectly healthy, and wisdom must prevail among the other producers in South Africa and enable selling prices to be raised to a level which would be fair to the producers instead of being all in favour of the consumer, as has been the case since the formation of this company. I want also to refer to the zealous work put in by our staff, both here and in South Africa. We have had many years of uphill work, but our staff have aided in every possible way; they are as anxious as we are to see the company enter the list of the regular dividend-paying concerns.

IMPROVED OUTLOOK.

To sum up my remarks regarding the future, I confidently look for a much better report this time next year, as we have our substantial increase in output, the increased price we are getting for a large portion of our tonnage, and increased revenue from our railway. And if I might look still further into the future, I anticipate that the following report will be even better, as, although we cannot expect to go on increasing our output from the existing mine, our new railway contract, which commences in January next, is an improvement on that of this year, and I am glad to detect a distinct feeling abroad that for sales for 1917 the producers should secure a substantial advance on the prices now ruling. I beg to move: "That the report of the directors now produced, together with the annexed statement of the company's accounts up to the 31st January, 1916, duly audited be now received, approved and adopted." I will call upon Mr. Polley to second this, and then, if any gentleman has any questions to ask, I will do my best to answer them.

Mr. Reginald Taylor said the main object he had in rising to speak was to ask if the chairman could give the shareholders any information with regard to what was being done in the neighbourhood of the property in connection with the obtaining of by-products from coal. There was a company in existence under the auspices of Brunner, Mond and Co., known as the Natal Ammonium, Ltd., which was actively engaged in the installation of plant for the production of three very important by-products from coal, which might be expected to have a very important influence upon the coal mining industry both in Natal and the Transvaal. He wished to ask whether the directors had in contemplation the installation in the near future of a by-product plant on the Vryheid property. If capital could be raised for that purpose—a thing which he thought was quite possible—the shareholders of the company would probably be placed in an entirely different position to what they were in now. In that case they would not have to depend upon the disposal of their coal at the pit's mouth at ruinous prices, but they would be able to obtain most valuable by-products, which would enormously enhance the earning capacity of the company.

The Chairman, in reply, said that the question of issuing funding certificates would have the careful consideration of the board. The only difficulty was that it would not put the company in the possession of more funds to develop the colliery. The question of being able to command more capital was one which the directors had to keep well in front of them. With regard to the by-product scheme, the directors were in very close touch with Messrs. Brunner, Mond and Co., and the general manager of the Vryheid Company was now on his way home with a view to considering the question of introducing by-product plant. The resolution was carried unanimously.

VERDITE MINES.

BRIGHT PROSPECTS.

The annual meeting was held on August 29th at the Stock Exchange Buildings of the Verdite Mines, Limited.

Mr. T. D. Cunningham presided, and in the course of his eloquent address spoke about the progress and prospects of the company, and said he felt more than ever to-day the optimism he had referred to last year. The real business had begun, and from now onwards he anticipated an unbroken run of success. He had been to England recently to place their products on the markets, and to get more closely in touch with buyers and users, as well as to appoint agents in various centres. In this he was successful, and he found that the demand for their talc was likely to be very great, one firm holding that they could sell 30,000 tons per annum, another 12,000 tons, and another 6,000 tons. They had already made two small shipments to London and one to New York. In the meantime their new talc plant had been running and turning out the finished article, and the local markets had not been neglected. A considerable demand had sprung up in this country, and this demand was likely to increase. They had all the advantages of freight, duty, and transport overland in their favour, and the industry was one that did not require anything in the nature of protection from the Government.

though the latter could assist them in many ways, as they had done already in the matter of railway rates.

Proceeding, the speaker said that during the last few months the working of the gold section by shaft sinking had been done away with, and as they were not dependent on a small reef carrying gold for their revenue, the work was now being done by open quarrying. In the course of the work the rich gold-talc lode at No. 1 shaft had again been revealed, and the crushing of this had just recently been started. A trial crushing from some rock from No. 2 shaft gave most satisfactory results, and gold of the value of over £81 was banked at the beginning of this month. Their financial position was quite sound. They had still 20,000 shares in reserve, and the stock of talc, greenstone and gold concentrates on hand at the end of February, estimated at £14,478, was valued at less than half its present selling price in this country, while no account had been taken of the gold which they might recover from the talc. The production of talc was a business of enormous importance. There were very few good talc mines in the world so far as was known, and practically none in the British Empire, except the Verdite Mine, so that they had the whole world for their market.

The report and balance sheet were adopted, and the following were elected as directors for the ensuing year: Messrs. T. D. Cunningham, J. M. Fisher, H. Rush, J. Cunningham, and C. Walshe.

COMMERCIAL EXCHANGE.

ANNUAL MEETING.

The annual meeting of members of the Witwatersrand Commercial Exchange was held on August 29th at the Chamber of Commerce, Mr. J. Mac G. Love, chairman, presiding.

In moving the adoption of the committee's report, the Chairman remarked on the gratifying increase in membership, which on the 31st of July stood at the record of 210. Revenue exceeded expenditure by £226.

The financial position was excellent, there being an amount of £4,095 on fixed deposit. A new lease has been entered into for the occupation of the Exchange premises for another five years from the 7th of September at a reduced rental of £720. During the year the committee had made representations to the Telephone Department in regard to the directory. Last week a circular was issued to subscribers stating that it had been decided to restore the numerical index and to transfer the advertisements to the foot of the pages.

War Funds.

In November last the sum of £1,017 1s. 6d. contributed by members and representatives on the Exchange was handed to the Oversea Contingent Fund, and a further generous response was now being made on behalf of the Governor-General's Fund. Many of their men had joined the Imperial Forces and are fighting their country's battles either in Europe or German East Africa and some of them had already given their lives in the present great struggle for justice and freedom. The German East campaign, thanks to the military genius of General Smuts, was progressing most favourably, but there was an urgent call for more men to fill the gaps caused by death or disease, and it was to be hoped that any eligible men connected with the Exchange who could go would go. He would like to thank Mr. Macdonald, the vice-chairman, and all the members of the committee for the valuable help they had at all times given him during his year of office. The year had been a very strenuous one for their secretary, Mr. Robertson, and he would like to thank him for the very able way in which he had carried out his duties, and the ready assistance he had at all times so willingly given to him.

The report and accounts were adopted. Mr. Fletcher was elected chairman and Mr. A. McDonald was re-elected vice-chairman.

Enemy Trading.

Mr. Hamilton moved that the incoming committee should find out whether there were any enemy firms trading on the Exchange, and if so, should put them off. In the case of any doubtful firms the committee should ask them to give details of their shareholdings, and any firm failing to comply with such a request should be put off. Further, he suggested that a deputation should wait upon the buyers from the different groups and ask them to buy as much as possible from "all British" firms. He had several firms in mind which he thought were German.

The Chairman (Mr. MacG. Love) said the position had been that the committee had more than once taken legal advice on the matter, and had been unable to do anything. The legal advice had been against them every time.

During the discussion it was said that German goods belonging to interned Germans had been sold.

Mr. Mortleman suggested that firms in liquidation be not allowed access to the Exchange.

Mr. McDonald explained that the legal advice had been against them on this point.

Mr. Hamilton urged that a bold stand should be made and a test case brought if necessary.

It was eventually decided that the new executive should go into the whole matter, and the unanimous feeling was expressed that the strongest measures should be taken to oust Germans at all costs.

Mr. Niven emphasised that members of the committee had done their level best to stop enemy trading.

On the suggestion of Mr. Philpott the committee were recommended to organise a scheme of monthly subscriptions for the Governor-General's Fund.

The election for the new committee resulted as follows:—Messrs. A. Y. Niven, R. H. Philpott, G. Lambie, F. L. Cartwright, W. E. T. Harvey, R. B. Greer, W. A. Martin, Z. Marsh, W. B. Phelps, and W. S. Wilson.

Rand Mines Group Quarterly Reports.

Ferreira Deep, Ltd.—Linear development, 2,146 feet. Tonnage crushed, 160,010 tons. Total yield, 67,216 ozs., equalling 8,401 dwts. per ton. Development operations resulted in a decreased footage, due principally to the completion of shaft sinking, No. 1 incline having reached its final depth, whilst at No. 2 there only remain the completion of stripping the shaft to its full size and timbering. The disclosures are satisfactory, and certain areas showing poor grade are being further prospected. Results showed a slight decrease in working profits, owing to a slightly reduced grade and smaller tonnage crushed. The native labour position during May and June showed large reductions, and the position is worse at the present time as, although every effort is being made to obtain a sufficient supply, the shortage continues serious and the profits for the current quarter will be affected. The working profit for the past quarter was £115,393.

Robinson G.M. Co., Ltd.—The tonnage crushed was 171,100 tons, and the yield 50,908 ozs., averaging 5,951 dwts. per ton. A dividend of 4 per cent. was declared on 13th June for the period ended 30th June. The working profit for the quarter was £91,342.

Modderfontein B. Gold Mines, Ltd.—The linear development during the quarter was 4,295 feet and tonnage crushed 137,500 tons, yielding 6,942 ozs., averaging 10,098 dwts. per ton. The working profit earned for the quarter was £167,047, equivalent to 24s. 4d. per ton milled. Development operations are being well maintained, and continue to disclose promising results. Capital expenditure for the quarter amounted to £5,504. A dividend of 37 per cent.

was declared on 13th June, 1916, for the period ended 30th June, 1916.

Geldenhuis Deep, Ltd.—Footage developed, 4,005 feet. Tonnage crushed, 172,100 tons. Yield, 52,971 ozs., averaging 6,156 dwts. per ton. A dividend of 12½ per cent. was declared on the 13th June, 1916. The quarter's working profit was £41,246.

Rhodesia's Gold Output.

The gold output of Southern Rhodesia for July was declared on Wednesday to be 76,999 ozs., value £322,365, being a decrease compared with the June output of 2,519 ozs., value £10,705. Matabeleland contributed 37,375 ozs., value £156,597, and Mashonaland 39,624 ozs., value £165,768.

New Patents.

202. Stephen Newcombe Wellington.—Improvements relating to apparatus for discharging and quenching coke.
203. Stephen Newcombe Wellington.—Improvements relating to furnace settings for the destructive distillation of coal or other carbonaceous substances.
204. Leon Byron Woodworth.—An improved switch for varying the intensity of electric lights.
205. Johan Sigismund Fastang.—Improvements in tube mills.
206. Frederick George Siddle.—Improved ox harness.
207. Charles Edmund Clews.—An improved means for securing cloths to vacuum filter frames.
208. Ruurd Fenenga.—Improvements in check valves.
209. John Hart and Edward Hector Lonsdale.—Improvements in receptacles, vessels or utensils for the storage and conveyance of carbide.
210. William Carbitt Pinder.—Improvements in or relating to water filters.
211. Benj. Henderson.—Automatic drill supporting bracket.

Engineering Notes and News.

*CRUSHING AND GRINDING MACHINERY.—II.

A Review of the Steady Development of Metallurgical Appliances.

CHILEAN MILLS AS GRINDERS.

The grinding stage following rolls will depend entirely upon what is to be done with the ore. If it is to be treated by some metallurgical process that requires its passage through comparatively fine screens—say 20- to 80-mesh—the rolls may, and do in some cases, deliver direct to tube mills, while in other cases the grinding may be performed by some one of the Chilean-mill type or even by finer rolls. Chilean mills are of two types—either the slow- or fast-running machines. In the first class is included mills of the older style such as were formerly used in Mexico—and of which many are still in use—in which there are usually two heavy rollers revolving slowly on a specially prepared die. The Chilean mills as used at Angustias and in Pachuca have a die diameter of about 7 ft. and use rollers 7 ft. in diameter, 22 in. face, and weigh between 7 or 8 tons each. Revolutions are at the rate of 12 to 15 per minute, and capacity to 30-mesh screen is about 15 tons per day. These mills require about 15 h.p. for operation. Mills of the type known as the Monadnock, the Akron, Evans-Waddell, Bryant and others, are of the high-speed type, usually having smaller die diameters (running up to 5 or 6 ft.), smaller rollers (from 3 to 4½ ft. in diameter) and operate at much higher speeds, usually in the neighbourhood of 30 r.p.m. Examples of the use of such machines that are doing good work may be found at Stratton's Independence mill, near Victor, Colo., and at the Portland mill at the same place. In referring to the use of stamp batteries, Julius I. Wile, in the *Journal* of April 17, 1915, says:—

“For tough ores it is probable that stamps will continue to be used on account of the high iron consumption of the ball mills on such ores, and it should be noted that on the Rand in South Africa the combination ball-and-pebble mill was tested against stamps and rejected, supposedly on account of the heavy iron consumption. The stamps generally used in America are the 5- and 10-stamp multiple batteries, the stamps being from 1,030 to 1,400 lb. falling weight. The 2,000-lb. Nissen stamp in tests on the Rand has demonstrated that it takes 25 per cent. less power and 10 per cent. less iron than the older type of the same weight, and this can be attributed to the quickness of discharge of the Nissen, due to the circular form of mortar surrounding the stamp shoe. Nissen stamps are also less costly to install when foundations and less space occupied are considered. It is well known that in the Lake Superior copper district, steam stamps have been used for years, and it would seem that here a heavy power-driven gravity stamp could be employed to advantage, as although the same power per stamp would be used for the same falling weight, it should use less fuel per horsepower than the direct steam stamp. In gold and silver milling, as cyaniding is now largely used there is no longer the objection to the use of heavy stamps on account of the slimes which would be made, and coarse screens are now used, as the finishing is done in pebble mills.”

Tube mills were introduced into the metallurgical field as a direct result of the requirements of the cyanide process. When it became apparent that slimes could be treated more rapidly and with a higher extraction percentage than sands, some method of easily grinding so that a maximum of slimes would be produced was required. The tube mill, formerly used in the cement industry—where extreme fineness is required—was adopted and almost immediately became standard practice. The overflow type of tube mill is the one most generally used, the circulation through which depends on the amount of feed and the discharge on the amount of slimes that are displaced, come to the surface of the pulp and float out at the centre. The discharge of tube mills of this kind may be protected by a grid

or perforated plate that will permit the exit of ground material without the loss of pebbles, or the mill may be operated without any protection at all, which is often done. In place of the grid for retaining the pebbles of the mill, a device which consists of a funnel-shaped discharge casting that is fitted to the discharge end of the tube mill was originated by Walter Neal. On the inside of this casting was placed a spiral screw-like riddle, operating in the direction opposite to the mill rotation. Any pebbles tending to escape through the discharge orifice were caught in this screw and returned to the interior of the mill. In many cases the discharge orifice was used as the point at which fresh pebbles were fed, since it was easy enough to throw them into the opening where they would be caught by the screw and delivered in the interior of the mill. In view of the fact, however, that the discharge end of the tube mill is the wrong place to use new pebbles for grinding, that practice has not been continued, and pebbles are almost universally added now at the head end of the mill through the scoop feeder. Tube mills are of many makes and specifications, but there are only two types that have universal attention. These are exemplified by the Hardinge conical mills and the ordinary cylindrical mills. The diameter of mills that have been used heretofore has varied mostly from 4 to 5 feet., and the length from 16 to 22 ft. The tendency now, however, is towards larger diameters, running sometimes to as much as 8 ft., and much shorter lengths, a 6-ft. length being not unknown. It is believed that with large diameters and short lengths and by dividing the grinding into stages, much more economical results are obtained.

FLINT AND IRON PEBBLES FOR GRINDING.

Flint pebbles have been used almost entirely for tube-mill grinding heretofore, the best having been obtained in the Scandinavian countries—Norway, Sweden and Denmark offering a good supply. The flint-pebble industry has grown considerably in France, however, where it is confined almost wholly to the coast line between Havre and Dieppe.

(To be continued.)

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*From the *Engineering and Mining Journal*.

THE NATIONAL PHYSICAL LABORATORY.*—II.

Report on the Engineering Department—Research Work—General Investigations.

TEST WORK—SPECIAL INVESTIGATIONS.

The Measurement of the Rate of Growth of Cracks in the Buildings of the Tower of London.—The three special micro-meters made for this purpose from Mr. Horace Darwin's design were completed in August, 1915. Of these, one measures the relative movement of the two sides of the crack perpendicular to the plane of the wall and the other two the relative movements in the plane of the wall in the horizontal and vertical directions. The hard steel pegs, one on each side of each crack, whose relative displacement was to be observed, were then cemented into the masonry. Observations were commenced in September.

Steam Joint Packings.—Most of the packings used for steam jointings have in the past been made abroad, and in consequence of the difficulty of obtaining supplies several British firms have been endeavouring to make in this country packings of equally good quality. The chief difficulty has been to obtain packings which can be used for joints in superheated steam pipes. Several samples have been tested in the apparatus for testing the blowing-out pressure of joints. The makers have been so far successful in producing joint rings varying from 1.32 in. to $\frac{1}{8}$ in. in thickness which will stand a pressure of 250 lb. per square inch at a temperature of 1,000 to 1,100 deg. Fah. without any signs of breaking down.

Calibration of Testing Machines.—Applications having been made for the calibration of tensile testing machines having a system of compound levers for measuring load, it became necessary to devise a simple method of calibrating such machines. These machines are not adapted for employment of the method which can be used for single-lever machines and are in most cases so designed that it would be impossible to adopt the method of loading with dead weights, a method which is at all times inconvenient. The method adopted is to prepare from a uniform bar of material a number of test pieces of different sizes to cover the range over which the machine is to be calibrated. Alternate pieces are then tested upon the laboratory machines and the breaking loads determined. The remaining pieces are then tested upon the machine to be calibrated and the results compared. By this means any change in the quality of the material along the length of the bar is compensated for and the difference of quality at the core and at the surface of the bar is eliminated, the two test pieces of the same size being taken next to one another in the bar. As the result of trials it was found that few materials are sufficiently homogeneous to give the required constancy of breaking load. The material employed was the mild steel bar used in the laboratory workshops, which has about 31 tons per square inch breaking load, and in which two consecutive pieces seldom differ in strength by more than one part in 700. In considering the accuracy required for such tests, it must be noted that the area of the test piece is seldom measured closer than within $\frac{1}{2}$ per cent. to $\frac{1}{4}$ per cent., according to the size of test piece used, so that if the machine is within this limit it is as close as is required.

* Abstract of Annual Report of Executive Committee.

In actual practice there is generally an error produced by the speed at which the last portion of the test is carried out, owing to the inertia of the jockey weight generally leading to a reading slightly higher than the real maximum being taken. This often amounts to about 1 per cent. of the load even with a careful operator.

Tests on Kapok and other Floats.—Further tests have been made upon Kapok floats on the same lines as those carried out in 1911 and 1914 for the National Lifeboat Institution.

Other Special Investigations.—Other special investigations which have been carried out include:—The resistance of concrete pipes to external crushing forces; torsion tests on aeroplane engine propeller shafts; tests on the efficiency of various processes for brazing cast iron; tests on steel bolts under forces inclined to the axis of the screw; investigation of the relative weathering endurance, under load, of doped and undoped cordage; investigation of shock strength of steel containing a high percentage of sulphur and phosphorus. Investigations in conjunction with the metallurgical department on the causes of failure of gas engine crank shafts, steam turbine wheels, compressed air cylinders, split rails, aeroplane engines and details of airship and aeroplane construction.

Work Done by Workshop Staff.—The construction of gauges for the Ministry of Munitions occupied the greater part of the time of the workshop staff during the year. In addition to this the following list comprises the more important items of construction carried out:—The construction of the third impact testing machine for the research on the methods of impact testing; the construction of a new testing machine for fatigue tests under complex stress; the construction of various appliances for determining the resistance of materials to rolling and sliding abrasion; the correction of a lead screw in the standard lathe; the machining of specimens for the three impact-testing machines and the complex stress fatigue-testing machine; construction of gauge-measuring appliances for the Metrology Department; the construction of a range finder for the Optical Department.

REPORT ON THE DEPARTMENT OF METALLURGY AND METALLURGICAL CHEMISTRY.

The activities of the department have been concentrated throughout the period under review either upon matters directly connected with the war or upon special investigations undertaken, as matters of national urgency, at the request of one or other Government department. As a consequence the ordinary work of the department, both in research and investigatory testing, has to a large extent been suspended, and there are very few matters to which reference can be made. A large muffle furnace for the annealing and heat treatment of steel and for other purposes has been installed in the heat treatment room of the Wernher Building. The muffle, by allowing of the heat treatment of larger specimens, fills an important requirement, but the furnace has not yet been made to attain the temperature which the makers claim for it. It is hoped to improve the performance of the furnace as soon as conditions permit the makers to give the matter their attention. The largest increase in the equipment of the department has arisen out of the research on the production of optical glass, which has been under-

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taken with the aid of a grant from the Board of Trade. The introduction of the equipment for this work has required a complete re-arrangement of the foundry, where two relatively large gas-fired furnaces have been erected and room has been found for the electric furnace plant.

Thermostat.—An appliance for the purpose of facilitating the continuous exposure of specimens of metal to any desired temperature has long been needed for metallurgical research work, where prolonged annealing at an accurately known and maintained temperature is frequently required. A device for this purpose which had been worked out by Messrs. Haughton and Hanson has now been constructed in vitreous silica and is regularly at work, yielding very satisfactory results. Apart from work connected with the war, the following items only concerning the activity of the department may be mentioned:—

Alloys Research.—This has been practically at a standstill so far as all theoretical research is concerned: recently, however, the strong wish has been expressed that this branch of the work should be resumed, and arrangements are accordingly being made with that end in view, the immediate object being the completion of the investigation of the ternary constitutional diagram of the alloys of aluminium with zinc and copper.

Magnet Steels.—As time has permitted Mr. Haughton has carried out a considerable amount of work in connection with the research on magnet steels undertaken by the laboratory under the auspices of a Committee of the Institution of Electrical Engineers. Interesting results have been obtained, but the research is not yet completed.

Metallurgical Chemistry.—A large number of metallurgical analyses have been carried out. In connection with the analysis of aluminium and its alloys, Mr. Withey has investigated the various methods available and has published the conclusions based on his extensive experience of these materials in a paper presented to the annual meeting of the Institute of Metals in March, 1916. With regard to steel analysis, special attention has been devoted to the question of the volumetric determination of sulphur.

General Chemistry.—A large number of tests have been made on glass, including durability tests on optical glass by the iodosin method, and solubility and cracking tests on laboratory glass ware. A number of samples of laboratory porcelain ware and of filter papers, all of British make, have also been examined and reported upon. It is satisfactory to note that in many cases the products submitted are at least equal to those formerly imported from abroad.

REPORT OF THE ADVISORY COMMITTEE FOR THE WILLIAM FROUDE NATIONAL TANK.

The year has been a very exceptional one. The practical stoppage of all mercantile shipbuilding has caused a considerable drop in the amount of ordinary model resistance test work. But a very large amount of work of an exceptional character has been undertaken for various departments of H.M. Government. This has necessitated an increase on the staff of the tank, both in the workshop and the office. Miss E. M. Keary, of Newnham College, Cambridge, has been appointed a junior assistant for seaplane test work, and Miss E. H. Burns has taken over the clerk's work. Three temporary woodworkers have been engaged for some months, and it has been necessary to place the whole

of the workshop staff on overtime to cope with the work. The number of experimental test runs made during the year has been 3,000, as compared with an average of 2,000 in the period before the war.

Models Tested for Firms.—The total number of ship models or variations of models tested for resistance during the past year has been 18. The best result obtained has been a 16 per cent. reduction of power at service speed. There are several vessels built or being built to the improved form arrived at by the tank experiments. In addition to this ordinary test work several investigations have been made both for the Admiralty and for the Board of Invention and Research.

Research Work Completed and in Progress.—The investigation of appendage resistance has proceeded one step further. Experiments have now been made on the effect of adding a given cause of resistance to different parts of the hull longitudinally, and these have shown the importance of keeping all appendages well away from the bow. This suggested that the working of flush instead of lapped plate edges and butts—particularly the latter—near the bow might reduce the resistance, and this was tried on two models.

The Future of the Electrical Industry.

The President of the Institution of Electrical Engineers having been invited to give evidence before the Electrical Trades Committee, it has been resolved by the Council that the following recommendations be submitted: (1) Some combination of British electrical firms, especially with regard to overseas trade, is desirable. (2) A Government Tribunal of the most independent character that can be devised to be appointed to control the electricity supply industry of the country, and also to prevent indiscriminate addition or extension of power stations or systems undesirable from the point of view of size, locality, or system. (3) In view of the necessity of securing the home market and that none other than British electrical apparatus be purchased in the United Kingdom, a protective tariff to be set up. (4) A permanent Advisory Committee to be appointed to ensure that as far as possible, raw materials and parts, as well as whole apparatus necessary to the trade of the British Empire, shall be produced within the Empire. (5) (i.) British-born Electrical Attachés to help in the Consular service, and (ii.) Trade Commissioners (Scientific and Technical Commissioners) to be appointed. (6) British Engineering Standards to be adopted throughout the Empire. (7) The use of the metric system to be made compulsory after a reasonable period; and during this period all trade catalogues to make use of both the British and metric systems. (8) The Institution to be granted a Charter so as to improve the status and training of electrical engineers. (9) A Central Engineering Board, consisting of representatives nominated by all the important institutions, to be established which all engineers (other than mechanics) would be required to satisfy as to the sufficiency of their technical training and general education before they could be recognised as proficient, so as to ensure that every engineer shall qualify for his profession in the same manner as a doctor or solicitor. (10) Closer co-operation of manufacturers and other employers of electrical engineers with the technical college is desirable to ensure that students are trained to meet the future needs of the industry.

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